

**MONITORING, VERIFICATION AND EVALUATION UNIT
AGRICULTURAL POLICY REFORM PROGRAM**

**MVE UNIT
APRP**

Sponsored by:

**Government of Egypt,
Ministry of Agriculture and Land Reclamation**

**United States Agency for International Development/Egypt
Office of Economic Growth, Competitiveness and Agricultural
Development Division**

**INTERMEDIATE
EFFECTS OF
POLICY
REFORM UNDER
APRP:
PROGRESS
INDICATORS,
1990-2001**



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LIST OF ACRONYMS

ALCOTEXA	Alexandria Cotton Exporters Association
APCP	Agriculture Production and Credit Project
APRP	Agricultural Policy Reform Program
CAAE	Central Administration for Agricultural Economics
CAPMAS	Central Agency for Public Mobilization and Statistics
CATGO	Cotton Arbitration and Testing General Organization
cif	Cost, insurance and freight
CIT-HC	Cotton and International Trade Holding Company
CY	Calendar Year
EAS	Economic Affairs Sector
ELS	Extra long staple cotton (Gizas 45, 70, 76, 77)
ERSAP	Economic Reform and the Structural Adjustment Program
EVI	Export value index
fob	Free on board
GDP	Gross Domestic Product
GOE	Government of Egypt
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HC	Holding Company
HC-SWRMC	Holding Company for Spinning Weaving and Ready Made Clothes
ICAC	International Cotton Advisory Committee
IFDC	International Fertilizer Development Center
IIP	Irrigation Improvement Project
lk	lint kentars
LS	Long-staple cotton (Gizas 75, 85, 86, 89)
MALR	Ministry of Agriculture and Land Reclamation
mlk	million lint kentars
MLS	Medium long staple varieties (Gizas 80 and 83)
MPE	Ministry of Public Enterprise
MPWWR	Ministry of Public Works and Water Resources (former name of MWRI)
MSHT	Ministry of Supply and Home Trade (formerly MTS)
MTS	Ministry of Trade and Supply (former name of MSHT)
MVE	Monitoring, Verification and Evaluation Unit (APRP)
MWRI	Ministry of Water Resources and Irrigation (formerly MPWWR)
PBDAC	Principal Bank for Development and Agricultural Credit
RMG	Ready Made Garment(s)
sk	seed kentars
TCF	Textile Consolidation Fund
TMT-HC	Textile Manufacturing and Trade Holding Company
UD	Universal density bale (of lint cotton)
USAID	United States Agency for International Development
USDA/ERS	United States Department of Agriculture, Economic Research Service

WPI Wholesale price index
WUA Water User Association

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There are individuals too numerous to name who gave their time and effort to make useful information available to the staff and consultants of the MVE Unit. This includes, but is not limited to, individuals in the following institutions: MALR, MWRI, MSHT, CATGO, the cotton textile holding companies, Textile Consolidation Fund, ALCOTEXA Information Center, PBDAC, and MPE/Fertilizer Bureau. Some of these individuals hold high positions in the Government; many are in the private sector. All of them have busy schedules. To all we extend our gratitude for their cooperation.

Any errors or omissions are the responsibility of the authors and the MVE Unit. The opinions expressed are those of the authors and the MVE Unit, and not those of USAID.

PREFACE

The MVE Unit measures some of the first effects of agricultural policy reforms implemented under APRP through the progress indicators reported herein. The long-run impact of policy reform is analyzed in the Unit's impact assessment program, so long-run measures of impact are generally not included in these progress indicators.

In December 1999 when the MVE Unit's first monitoring report (Ender et al., 1999) was published, data were only available to measure the progress indicators for a period before APRP began. With the passage of time and some acceleration in the availability of data, this report is now able to report progress indicators for years (1996-2001) covering more or less the full duration of APRP¹, in addition to the baseline period (beginning about 1990). These progress indicators generally provide a good picture of some of the short- and medium-term effects of some key APRP reforms.

The first monitoring report included a wide range of progress indicators that had been suggested by the staff of the APRP technical assistance units and our colleagues in the GOE and USAID. After compiling the required data, analyzing them, and reporting on those indicators, the Unit made a preliminary assessment of the utility of the indicators as progress indicators for APRP. Those indicators considered best for continuation as progress indicators for APRP are those that bear a direct relationship to specific reforms under way in APRP. Data can be found to measure these indicators, and their interpretation is generally straightforward. At the other end of the spectrum are indicators that are only indirectly or remotely linked to specific reforms (although they may measure ultimate impact), or complex in themselves and therefore hard to interpret. Based on the assessment made in the first report, the indicators no longer being calculated and reported are: nominal protection coefficients for urea and rice, the correlation coefficient between prices of US Pima and Egyptian cotton, the real value of ready-made garment exports, the ratio of earnings of non-banking activities to total earnings for PBDAC, and agricultural resource income. Those indicators remaining in the report are not perfect combinations of the attributes mentioned above, but the indicator data, when viewed in the light of the analysis provided in the report, should be useful to those interested in the progress of APRP reforms.

Preparation of a report like this one requires a significant amount of time and effort. The MVE Unit assembled time-series data from various sources, most notably MALR (especially EAS), MWRI, CAPMAS, MSHT, MPE and many other agencies and private companies. These data should be interpreted with caution. Despite this caveat, the Unit feels that these data, once interpreted, provide a reasonably accurate picture of important developments in the agricultural sector and leading subsectors in the agribusiness system.

¹APRP technical assistance began in November, 1996. It declined significantly in the first half of 2002 and will terminate completely by September, 2002.

EXECUTIVE SUMMARY

This report is based on progress indicators for years (1996/97 through 2000/01) covering nearly all of APRP², in addition to the baseline period (beginning about 1990), on which indicators were previously published. These progress indicators generally provide a good picture of some of the short- and medium-term effects of some key agricultural policy reforms carried out under APRP. Longer-run impacts of the reforms have been assessed under the Unit's impact assessment program.

Of the twelve separate indicators presented, seven were generally increasing during APRP. All but two of the twelve seem to have been positively affected by policies during the period. There was apparently a dramatic increase in the production of rice per unit of water. This was the culmination of the coordinated program to change irrigation scheduling in conjunction with the steadily increasing adoption of higher-yielding short-season varieties. After being volatile and mostly falling since 1990, yarn exports stopped declining during 1999-2001.

Some of the types of progress during APRP that led to these changes in the indicators include:

- privatization of two of the five public cotton ginning companies³
- gradual improvements in various policies affecting cotton exports
- privatization sales, leases, and other policy improvements inducing the private sector to invest in modern cotton spinning
- consolidation of the return to private marketing of fertilizer through an early policy benchmark, which was, however, apparently reversed in early 2002
- attainment of substantial water savings from short-season rice cultivation through key changes in policy and irrigation scheduling

Many other types of progress are under way, but for these it is still too early to see the results. There are many types of improvement in water management, including the matching of irrigation supply and demand through the collection of real-time planting intentions data; ALCOTEXA is now run by a truly private management team that is contemplating important changes in export pricing and grading of cotton; subcommittees of the Agricultural Commodity Council are taking part in policy formulation; a cold storage unit is due to open in the customs area of Cairo airport later in 2002; and MALR is making many improvements in its systems for collection, analysis and publication of production (including pre-harvest forecasts) and farm-income data, which will assist farmers and traders in making important planting and marketing decisions, to name just a few.

The progress indicators are summarized individually in a matrix, below. The matrix provides a brief narrative of the effects that policy reforms during the 1990-2001 period seem to have had on the level of

²APRP technical assistance began in November, 1996. It declined significantly in the first half of 2002 and will terminate completely by September, 2002.

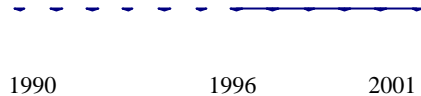
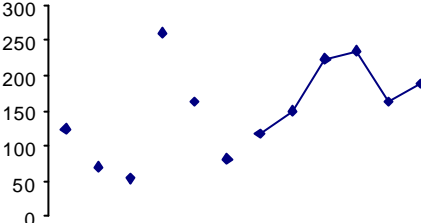
³See Krenz and Mostafa, Special Study No. 3.

the indicator. Special emphasis is given to the 1996-2001 period (i.e., the duration of APRP). Next to each narrative is a graph of the indicator values, so the reader can assess the trend during the baseline and APRP periods. In the last column of the matrix is an assessment of the effect of policies during APRP. The full details of the progress indicators, including data sources, tables, figures, and analysis, are given in the body of the report.


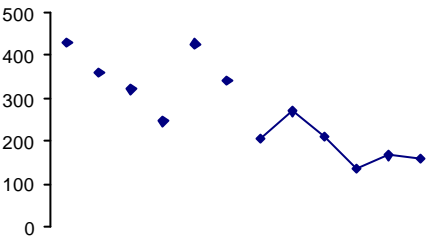
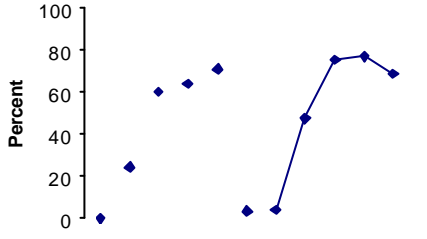
It may be pointed out that the data for a significant number of indicators are unpublished. This can be seen by perusing the sources of the tables in the body of the report. Of the data for the twelve progress indicators, data for four are completely published, data for four are completely unpublished, and the data for the remainder are a mixture of published and unpublished. In some cases the MVE Unit needed to carry out a survey to collect the data directly. In some cases, even the published data are not disseminated very widely, or they are available only in highly aggregated form (e.g., spinning industry employment and output) and cannot be cross-checked. If the transition to a market-based economy is to proceed smoothly and efficiently, the Government should remedy this situation by publishing all such essential data in a careful, timely, and open manner⁴.

⁴Some of the ministries with which APRP is collaborating have made serious efforts to improve data collection and dissemination. Among those efforts that should be mentioned are the MALR program to publish data on agricultural production by season in a much more timely fashion, its publication of the incipient farm income data series and gender-disaggregated data, its excellent improvements to the agricultural census (including first-time data for the New Lands), and its program to forecast key crop yields during the growing season to benefit both private traders and policy makers. MFT is beginning a program to publish trade data on a more timely basis through a web site and monthly bulletins.


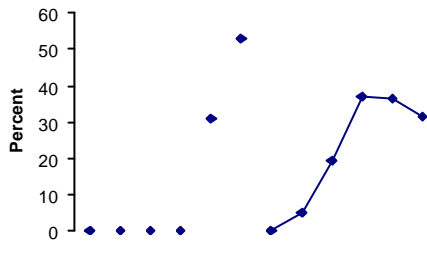
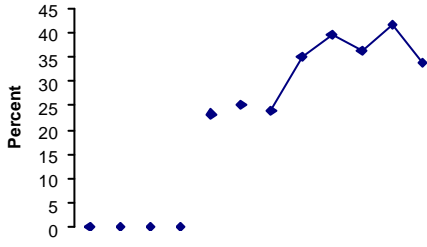
PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
			
1.a) Real value of cotton lint exports	<p>Cotton exports were volatile (no significant trend) during the decade ending 1999/2000. In the early years of agricultural reform (1986/87 to 1992/93), the real value of cotton lint exports declined by 38 percent per year, while later and during APRP (1995/96 to 1999/00) they increased at an annual rate of 29 percent. Exports fell off in 2000/01 from their late 1990s' peak, dropping below 70,000 mt/year. Export commitments in 2001/02 rebounded to nearly 100,000 mt, a GOE and ALCOTEXA target, as of mid-July 2002. Cotton lint exports have frequently been hampered by policies, including minimum export prices and/or minimum export grades that are set too high or by bans or quotas on exports. Exports have been volatile partly due to world supply and demand conditions, and partly due to domestic supply constraints (production shortfalls in 1999/00 and 2000/01, and decisions to allocate most of the crop to domestic spinners). Data shown are in constant LE of 1986/87, in millions.</p>		Improved


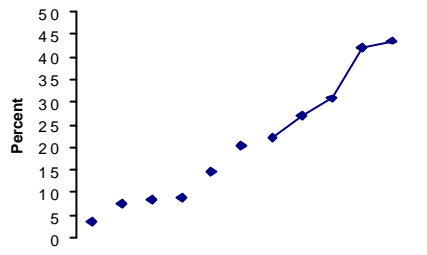
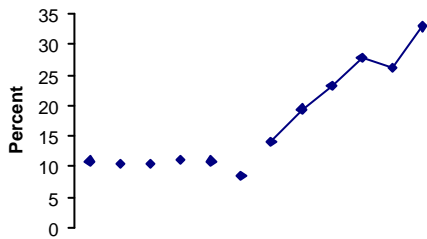
PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
		 <p>1990 1996 2001</p>	
1.b) Real value of cotton yarn exports	The real value of cotton and cotton-blend yarn exports declined at 9.3% percent per year from 1991 to 1999. Yarn exports recovered moderately in volume and value terms in 2000 and 2001, but levels remained well below those before 1999. Yarn exports are hindered by some policies, including minimum export prices. Moreover, the difficulty of importing lint (because of a rather rigid phytosanitary policy) restricts the flexibility of spinners and results in lower yarn exports when seed cotton production is lower in Egypt. Like lint exports, exports of yarn have been volatile partly because of world supply and demand conditions. Yarn output and exports are down in large part because spinning remains dominated by public companies, which are in financial difficulty and operating at low capacity. Data shown are in constant LE (millions) of 1986/87.		Mostly negative
2. Private sector share of distribution of nitrogenous fertilizer	This indicator is a direct measure of the effects of reforms undertaken under APCP and APRP and of an intervening "crisis." After significant progress toward putting fertilizer distribution in private hands, the GOE put it back with PBDAC in 1995/96 before gradually liberalizing again in the aftermath of the problems. By 1997/98 the private share of distribution had reached almost 50 percent; by 1999/00, it had surpassed 75 percent. PBDAC was no longer taking much fertilizer from the factories, but may retain some sales leverage over farmers (to reduce its stocks) through its provision of credit. The PBDAC share had stabilized at less than 10%. In 2002 the danger of significant backsliding arose with the issuance of instructions for the PBDAC share to return to 50% of factory sales, despite the absence of any serious crisis and despite apparent private sector restraint in pricing.		Positive, but apparent backsliding in 2002

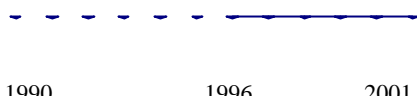
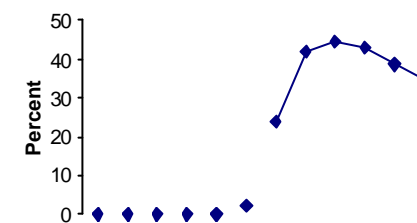
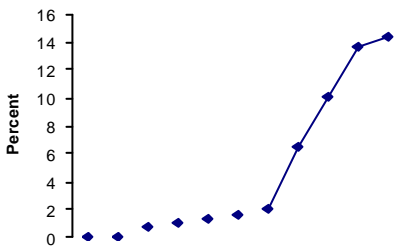
PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
		 <p>1990 1996 2001</p>	
3.a) Private sector share of seed cotton trade (volume)	<p>This indicator is a direct measure of changes in cotton marketing and pricing policies. The private sector was allowed to enter this area in 1994/95. Since that time the GOE has made annual changes in policies, including minimum export prices and qualities, seed cotton floor prices, allocation of PBDAC-run seed cotton purchasing sites, and deficiency payment schemes. These changes have often hampered the ability, and reduced the willingness, of the private sector to participate in seed cotton marketing, despite a clear desire by many companies and individuals to do so. After reaching 53 percent in 1995/96 before dropping to zero in 1996/97, private sector deliveries of seed cotton to the gins climbed back to 37 percent by 1999/2000, stayed at that level in 2000/01 (36 percent), and fell off slightly to 2001/02 (31 percent).</p>		Mostly positive
3.b) Private sector share of cotton ginning (volume)	<p>At the beginning of APRP, the GOE took clear and positive steps in the area of privatizing cotton ginning: it privatized two of the five public ginning companies. Privatization followed leasing of some gins that began in 1994/95. These steps, as well as improvements to ginning in the private companies, are reflected directly in the significant share of lint that is now produced in private gins (37-42 percent in 1998/99 through 2000/01). The private share dropped to one-third in 2001/02, the lowest since 1996/97. Currently privatization in ginning is stalled, mostly over the proper method for handling the transfer of the valuable land on which many gins are situated. Excess national ginning capacity also deters private investment, especially when two of the three remaining public companies have been offered as large multi-gin entities, rather than gin by gin.</p>		Mostly positive


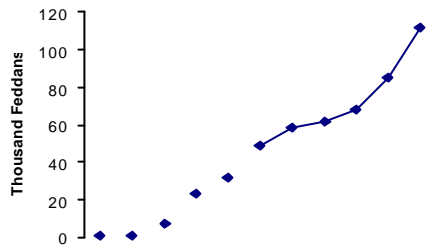
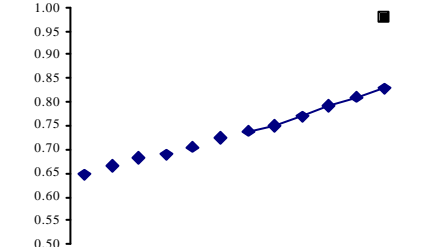
PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
		 <p>1990 1996 2001</p>	
3.c) Private sector share of cotton spinning (volume)	The share of yarn spun by the private sector increased steadily in the 1990s to 40 percent by 1999/2000 and 2000/01, driven partly by an expanded number and output of private sector spinners, as well as by the decline of public spinners' output. The GOE has privatized two affiliated spinning companies since 1997/98 and leased out three major units of others. The private sector invested in a dozen new medium-scale operations, and the smaller traditional spinners also continued to increase in number and size. The complex set of policies affecting the decision to invest in spinning seems to have been more conducive to private investment in this industry by the end of the 1990s than at the beginning of the decade. As public sector spinning output continues to decline, more opportunities will emerge for private investors to establish private spinning units to meet various market niches.	 <p>Percent</p>	Mostly positive
4. Private sector share of volume of wheat milling	Commercial private mills are not allowed to purchase domestic wheat. Investment in wheat milling, however, is open, and has expanded rapidly since 1995 with imported wheat as input. The private share of all wheat milling reached 33 percent in 2000, while the private sector's share of fine wheat (72% extraction) flour milling reached 61 percent. However, many recent private investors in 72-percent milling are incurring losses due to low capacity utilization. MSHT's program requiring all stone mills to be converted to more modern technology is likely to reduce the private sector's share of 82-percent flour milling.	 <p>Percent</p>	Mildly positive

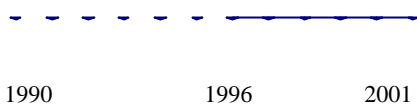
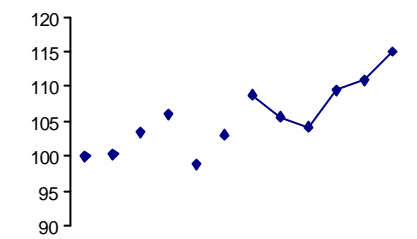
PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
		 <p>1990 1996 2001</p>	
5.a) Private sector share of employment, cotton ginning	Privatization of the cotton ginning industry started well, but has stalled since 1997. The private share of employment in ginning reached more than 44 percent in 1998/99, but dropped to 35 percent by 2001/02. The effects of an aggressive early retirement program at Arab Ginning were reinforced by greater numbers of public employees in 2001/02, a year of greater cotton area and output relative to the two previous seasons. It is unlikely that there would be further gains in this indicator until privatization resumes.		Mostly positive
5.b) Private sector share of employment, cotton spinning	This indicator moves in the same direction as the private share in cotton spun. The amount of labor in private spinning accelerated in the latter half of the 1990s with the accumulated effects of policy reforms, reflecting the new modern investments and expansion by the traditional private spinners, who use more labor. The private sector's share of spinning of cotton and blended yarn by volume is now about 40 percent, whereas its share in spinning employment is only about 14 percent. This difference mostly reflects the higher productivity of labor in private spinning, although there are some unavoidable measurement problems that may exaggerate the amount of labor counted in public spinning.		Mostly positive

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
		 <p>A line graph with a horizontal axis representing years from 1990 to 2001. The data points are connected by a line that remains perfectly flat, indicating no change over time.</p>	
6. Irrigated areas under private water user associations (WUAs)	WUAs started on a limited basis under IIP, and at present they cover a very small percentage of the total cultivated area (more than 7 million feddans) in Egypt. They may be ready for a more rapid expansion after APRP, as WUAs are formed on branch canals, and if MWRI promotes water boards.	 <p>A line graph with a vertical axis labeled 'Thousand Feddans' ranging from 0 to 120. The horizontal axis represents years from 1990 to 2001. The data points show a sharp upward trend, starting near zero in 1990 and reaching approximately 115 thousand feddans by 2001.</p>	Positive
7. Volume of paddy rice production per unit of water	Attempts by the GOE to control total rice acreage to conserve water generally did not meet with great success. The indicator nevertheless reveals some apparent efficiency gains in the use of water to produce rice (from .65 kg./m ³ in 1990 to .83 kg./m ³ in 2001). These improvements resulted mostly from the adoption of higher-yielding short-season varieties that were largely bred and distributed before APRP. Recent efforts of MALR and MWRI to capture the water-saving benefits of short-season rice varieties through coordinated planting and irrigation and a shortened irrigation season increased the level of the indicator significantly in 2001. Although precise data on changes in irrigation scheduling are not available, the indicator is likely to have reached almost 1.0 in 2001 (upper point on graph). This is a major policy impact of APRP.	 <p>A line graph with a vertical axis ranging from 0.50 to 1.00. The horizontal axis represents years from 1990 to 2001. The data points show a steady upward trend, starting at approximately 0.65 in 1990 and reaching about 0.83 in 2001. There is a final data point at the top right of the graph area, slightly above the 1.00 mark.</p>	Very positive

PROGRESS INDICATORS: SUMMARY OF POLICY EFFECTS DURING APRP, cont'd

Indicator	Effects of Policy Reforms	Indicator Trend	Policy Effect during APRP
		Before APRP APRP	
			
8. Agricultural production per unit of water	This indicator measures the overall impact of a wide range of policies on agricultural production and on water availability and conservation. The data do not cover tree crops or any production on the New Lands, which creates a bias in the indicator, probably downward. The index number (1990=100) peaked in 1996, equalled this level in 1999, and reached its highest level in 2001. Despite the very high percentage of Egyptian agriculture that is fully irrigated, this indicator remains somewhat volatile, partly due to weather-related crop yield variations.		Unclear

1. REAL VALUE OF EXPORTS OF COTTON LINT, AND COTTON AND COTTON-BLEND YARN

Definition of Progress Indicators

These indicators are defined simply as the level of exports, in value terms. The total value of exports is deflated to ensure that the indicator reflects real increases in exports (as valued by the market), not simply an increasing trend in the prices of all goods. The wholesale price index is used for deflating, and the result is then expressed in constant Egyptian pounds of 1986/87. Adding up the volume of exports would also give an indication of whether the amount of exports was increasing or not, but the volumes of different counts of yarn (or different varieties/grades of lint) should not be added together directly; this would omit the valuable information contained in their differing prices and thus not reveal whether the increased exports were more or less highly valued by importers. Exports of lint and yarn that are valued in international trade in nominal US dollars are converted to Egyptian pounds at the official exchange rate. Thus the deflated indicator does not attempt to compensate for any possible effects of misalignment of the exchange rate.

Relationship of Progress Indicators to Reforms under APRP

The textile industry is one of the largest industries in Egypt. Exports of cotton as lint and yarn are among the main sources of foreign exchange. For these reasons, under APRP considerable effort has been devoted to streamlining and opening up the cotton subsector. These efforts have taken the form of privatization of producing companies (as well as cotton ginning and spinning companies), liberalization of the domestic market and its price and phytosanitary trade barriers, and attempts to allow the production of American or upland cotton in Egypt. The MVE Unit discovered (see Holtzman, Mostafa et al., 2000) a significant number of private spinners who have invested in spinning, particularly open-end spinning, since 1994/95 in part because of the more conducive policy environment. These have been two new investments in ring spinning, one in Sadat City that came on stream in 1998 and a second one in Borg El Arab that will soon be operating.

1a. Real Value of Cotton Lint Exports

Sources of Information

ALCOTEXA – dollar export values and export volumes by variety, 1995/96 to present
Cotton and International Trade Holding Company (merged with the Spinning, Weaving and Ready-Made Clothes Holding Company in June 2000) – cotton utilization, including exports
CAPMAS – wholesale price index, exports (for export value index)
Central Bank of Egypt – monthly exchange rates

Calculation of Progress Indicator

See definition. ALCOTEXA reports seed cotton area (data are published officially by MALR) and lint production, exports, domestic utilization and carryover by cotton marketing year, which runs from September of one year, following the seed cotton harvest, to the end of August of the following year. The crop marketing year is a more appropriate period for grouping, analyzing and presenting data for a crop than the calendar year, which cuts across more than one crop marketing year. In using market years, it is easier to relate marketed and exported volumes and values to crop production in the current year, carryover from earlier years, and domestic utilization in the current year.

The deflator used in this indicator is the wholesale price index (WPI) for a cotton marketing year, which is calculated as an annual average of monthly index values for the period September to the following August. Export values, stated in nominal dollars, must first be converted to Egyptian pounds using an annual exchange rate calculated from monthly exchange rate data for the September to August period. Then the lint export value data, expressed in nominal Egyptian pounds, are deflated using the annual wholesale price index for the cotton marketing year.

A second deflator used for comparative purposes is the index of total export revenues (EVI). This is calculated, using 1986 as the base year, as an index of the nominal value of Egypt's total merchandise exports, including agricultural and non-agricultural products (industrial, petroleum), but not including services (tourism, Suez Canal revenues).

Results and Analysis

Beginning with Monitoring Report No. 3, we used cotton lint marketing year statistics rather than calendar year data. Calendar year figures cut across two marketing seasons and are hard to interpret. We also include some analysis of production and export data over the entire agricultural policy reform period, 1986/87 to 2001/02, which completes the picture and helps us to relate export values to physical output and flows, as well as to world market conditions. (See the Annex for supplementary tables).

Policy can have a major impact on lint exports, in the setting of either minimum export prices or minimum export grades that are too high. Quantitative restrictions (QRs) on exports have also been imposed at certain times by the GOE. These QRs have taken the form of export quotas for certain varieties, particularly long-staple varieties used in the domestic spinning industry, or outright bans on exports of particular varieties. Note that exports of three popular long-staple varieties were subject to unwritten overall quotas during the 2000/01 marketing season. During 1995/96, no exports of long-staple varieties were allowed in order to meet the requirements of the domestic spinning industry. Only ELS exports were permitted during a short period in February 1996. In addition to policy variables, exogenous events in the world market, particularly shifts in the supply of competing types of ELS and LS cotton lint (e.g., U.S. pima production) and dips in demand for fine cotton (e.g., caused by the Asian financial crisis in 1997/98), have affected Egyptian lint export levels and prices.

Using marketing year data, *some highlights of cotton production and exports during the 1990s* were:

- Cotton production declined steadily from 1980/81, a near record year, to a three-year low period from 1990/91 to 1992/93. Low output during the first two of these years was coupled with high levels of domestic utilization of Egyptian lint, averaging 5.5 million lint kentars (mlk) per year (over the three-year period) and representing 86%, 81% and 71% of total supply (production plus carryover, as shown in the Annex).⁵ *Domestic utilization declined from over 5.3 mlk per year or higher during the first four years of the 1990s to the 4.0-4.1 mlk*

⁵ These high levels of domestic utilization were only surpassed during two other periods (5.584 mmt from 1985/86 to 1987/88, and 5.939 mmt from 1978/79 through 1981/82).

range from 1994/95 through 1998/99, with the exception of 1997/98, when it rose to 4.6 mlk. Egyptian cotton production dropped to the lowest levels since World War II in 1998/99 through 2000/01.

- The 1993/94 export season, which was completed before the three laws to liberalize the cotton market were passed in 1994, was exceptionally good, as 2.35 million lint kentars were exported, largely due to a bumper crop of 8.3 mlk. Yields in 1993 were the highest ever recorded, 9.4 lint kentars/feddan. Export revenues were 4-5 times higher than in 1991/92 and 1992/93, reaching \$221 million, only surpassed in 1998/99 and 1999/2000 since the beginning of agricultural policy reform in Egypt. 1994/95 was also a good export year, with 1.3 million kentars shipped and export revenues of \$146 million. The average export price per pound was only \$0.86/lb in 1993/94 and rose in 1994/95 to \$1.00/lb. but remained low. Carryover from 1993/94 into 1994/95 was also high, permitting strong exports, despite a 39% smaller 1994 cotton crop. Domestic utilization took a steep drop from 1993/94 (5.424 mlk) to 1994/95 (4.1 mlk), as the domestic industry suffered from financial problems and the loss of the captive Soviet and Eastern European markets. *Declining domestic utilization freed up lint for export during the 1990s.*
- *In 1998/99 the nominal value of cotton lint exports reached \$242.5 million, followed in 1999/00 by 244.4 million, the highest during APRP and since 1988/89.* This increase was the result mainly of higher export volume than other years, with the exception of 1986/87 and 1993/94. The real value of cotton lint exports (in constant LE) increased from 1995/96 to 1999/00. Following high lint export prices in 1995/96, a year of limited exports restricted to ELS varieties, (nominal) export unit prices (in \$/lb.) declined from 1996/97 on, contributing to higher export volumes. A decline in U.S. pima production in 1999/2000 led to higher export prices that marketing season relative to 1998/99 and similarly strong Egyptian export volume, despite two successive years of lower seed cotton production in Egypt. ALCOTEXA set opening prices lower each year from 1996/97 on, in response to lower world prices, before raising prices in 2000/01 in recognition of tighter world supply conditions.
- Following large areas sown to cotton and large crops in 1996 and 1997, *area planted and cotton output declined successively in 1998, 1999 and 2000*, while rice area and output soared in 1999 and 2000. Farmers reduced area to cotton in response to uncertainty about government pricing policy at the time of planting, declining seed cotton prices, and lower real returns to cotton from 1995 through 1998. Rice area expanded as prices and returns were higher to rice cultivation from 1996 through 1999, as well as to the rice rotations with other crops (berseem, wheat, fava beans). Because cotton must be planted early (by the end of March) to obtain maximum yields, many farmers prefer to harvest another cut of berseem or to grow wheat (which is harvested from mid-April to mid-May) before planting rice. Paddy can be planted in nurseries for transplanting in late May or early June, so growers who choose to plant rice can delay field planting for 1.5-2.5 months beyond the optimal planting dates (2-3 week range in March) for cotton.

- Over the first years of the extended policy reform period (1986/87 to 1992/93), export revenue from ELS lint comprised from 60% to 80% of the total value of lint exports. This dropped to the 35% to 45% range during most years of the later reform period (1993/94 to 1999/00), with the notable exceptions of 1995/96, when no long-staple cotton exports were permitted, and 1998/99, when the value of ELS exports hit a low 24%. The 1998/99 marketing season was an anomaly in that respect, as ELS exports comprised a more normal 45.6% of total export revenues in 1999/2000.

While area planted to cotton declined 41% from 1996/97 to 2000/01, export volume and revenues rose steadily from 1995/96 to 1998/99 and were maintained at high levels in 1999/2000. Export volume, as a percentage of total lint supply (production plus carryover), was 24.8% in 1998/99, 27.7% in 1999/2000, and 26.9% in 2000/01. The proportion of the crop exported was higher during these three years than for any other years during the reform period. This is a positive achievement, which shows that Egypt is committed to maintaining significant shares in foreign markets, which was not considered the case during the early 1990s, when exports represented only 4-6% of total supply over a three-year period (1990/91 to 1992/93) and was only 6.4% of total supply in 1995/96.

The increasing relative importance of exports is also evidence of how distressed the domestic spinning industry has become; utilization fell 52% from 1992/93 (5.7 million lint kentars) to 2000/2001 (2.7 million lk). Exports in the marketing year 2000/01 were nearly 28% of total Egyptian lint supply, though export revenues declined to \$164.7. Domestic use of Egyptian lint reached only 2.7 mlk in 2001/01.⁶

Figure 1-1 shows the nominal and real value of lint exports over the extended agricultural policy reform period, 1986/87 to 2001/02. What is most impressive is the *volatility of export volume and real export revenue*. This volatility is a function of multiple factors:

- seed cotton production in the current year
- lint cotton carryover from earlier years
- the requirements of the domestic spinning industry (administrative requirements until recent years, when more market-based demand intervened)
- Egyptian lint export prices, relative to U.S. pima, the main competitor (administered minimum export prices have only recently been relaxed somewhat)
- foreign (and domestic) demand for Egyptian spinners' yarn, spun from Egyptian lint
- policy uncertainty associated with pricing at multiple levels of the cotton subsector, ability to export lint (in light of demands to satisfy administratively determined domestic lint requirements), and administration of subsidies (reimbursement of deficiency payments to growers, e.g.)
- MALR decisions regarding cotton varieties (phasing out/introduction of new varieties; area planted to each variety)

⁶ Domestic spinners' utilization of Egyptian lint was supplemented by large-volume imports of Greek, Syrian and Sudanese cotton in 2000/01 (an estimated 575,000 lk).

Both the nominal value and the real value of cotton lint exports (with both deflators) fluctuated over the extended policy reform period, 1986/87 to 2000/01 (see Figure 1-1). Breaking the extended reform period into segments reveals that nominal and constant export earnings trended downward strongly (at an annual rate of 38 percent) from 1986/87 to 1992/93 before spiking upward in 1993/94, dropping in the two successive years, and then trending upward from 1996/97 through 1999/00 (at the rate of 29 percent), before dropping off 29% in 2000/01.⁷ *The trend for export revenues during the APRP period is generally positive, matching the expansion in lint export volume.* Nominal export revenues (in \$) were significantly higher in 1997/98 through 2000/01 than in the two initial years of APRP, 1995/96 and 1996/97.

The constant (deflated) value of exports in 1999/00 hit their highest level during APRP before declining 30.5% in 2000/01. Following a downturn in world demand for fine cotton at the time of the Asian financial crisis (1997-98), demand for Egyptian lint was strong during 1998/99 and 1999/00, which resulted in high export prices and the highest export volumes since 1993/94. The 2000/01 export marketing season started strongly, with virtually all of the commitments made during the first 12 weeks of the season, but actual shipments never ended up matching commitments, falling short by 18%. This was due largely to the fact that importers did not want to pay early season premium prices for lint, which had declined significantly in price by the spring of 2001, nor did actual foreign spinner use of imported lint match projected requirements made in the fall of 2000. Economic slowdowns in importing industrial countries led to a decrease in foreign spinner demand. Hence, Egyptian lint exports in 2000/01 fell short of commitments as well as earlier year shipment levels.

Export commitments during the first 29 weeks of 2001/02, as of 4 May 2002, reached 79,541 mt, and the private sector had achieved 71% of the commitments. This private share is the highest during the APRP reform period, with the private share of export shipments reaching 54.9% in 2000/01. Note, however, that export commitments during the first 11 weeks of the 2000/01 marketing season reached the higher level of 79,383 mt, but only 68,432 mt were eventually shipped. The lesson of 2000/01 (and also of 1996/97) is that commitments do not necessarily equate with actual shipments, although 2000/01 was a year when actual shipments fell unusually short of commitments. Over the course of most seasons, though, shipments end up being about 95% of commitments. We use the dollar value of total commitments as of 30 March 2002, although most private traders reported offering substantial discounts below the ALCOTEXA minimum prices on which ALCOTEXA's value estimates are based. New export commitments each week are coming in briskly enough to justify assuming that commitments, as of 30 March 2002, may well equal final shipments.

Although the nominal value of export commitments in Egyptian pounds for 2001/02 may end up approaching the highest estimated levels (during APRP) for 1998/99 and 1999/00, this is largely driven by the higher LE/\$ exchange rate. After adjusting for domestic inflation, export revenues in constant LE (1986/87) drop considerably (20%) for 2001/02 relative to the peak export seasons. When the

⁷ The value of export shipments declined from \$244.4 to \$164.7 million in nominal terms from 1999/00 to 2000/01. Since the dollar strengthened against the pound, the nominal revenue in LE terms did not decrease proportionally quite as much.

export value is used as a deflator, the constant value of line exports in 2001/02 declines even further (38%) relative to the peak years of 1998/99 and 1999/00.

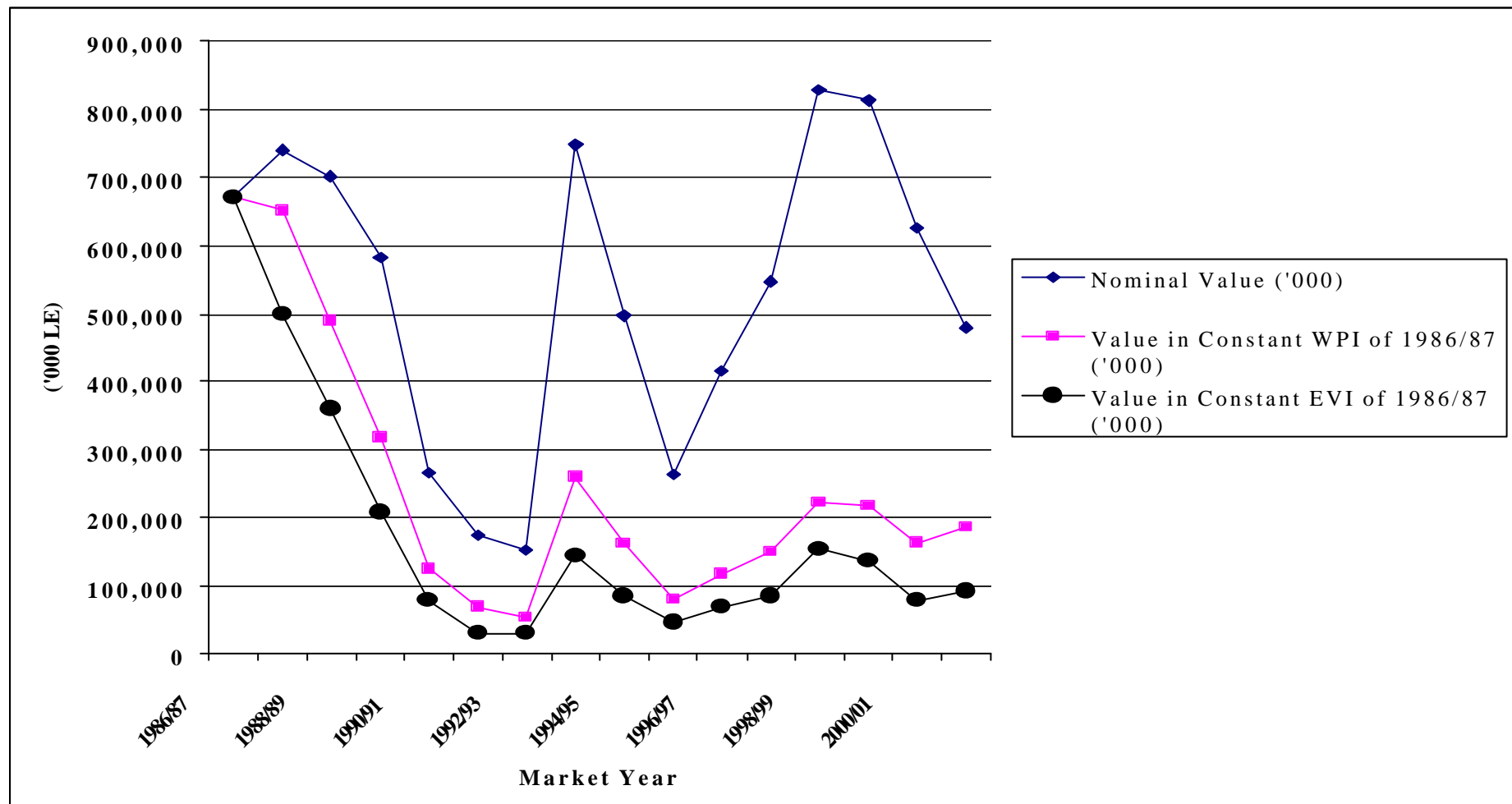
Table 1a-1: Nominal and Constant Values of Cotton Lint Exports, 1986/87-2000/01

Market Year	Nominal Value (\$ '000)	Aver. Exch. Rate (LE/\$)	Nominal Value (LE '000)	Wholesale Price Index (1986/87=1.00)	Value, Constant LE of 1986/87 (LE '000)	Export Value Index (1986=1.00)	Value, Constant LE of 1986/87 (LE '000)
1986/87	328,824	2.04	670,801	1.00	670,801	1.00	670,801
1987/88	329,179	2.25	740,652	1.14	651,687	1.48	499,442
1988/89	288,866	2.43	701,945	1.43	489,198	1.94	360,990
1989/90	221,225	2.63	581,822	1.83	318,557	2.79	208,380
1990/91	87,564	3.04	266,194	2.13	124,797	3.39	78,626
1991/92	52,806	3.31	174,788	2.52	69,490	5.73	30,515
1992/93	45,807	3.34	152,996	2.82	54,285	5.05	30,295
1993/94	221,049	3.38	747,146	2.88	259,516	5.16	144,845
1994/95	146,440	3.39	496,430	3.05	162,604	5.81	85,514
1995/96	78,055	3.39	264,605	3.25	81,542	5.82	45,466
1996/97	122,601	3.39	415,616	3.52	118,207	5.98	69,523
1997/98	160,777	3.41	548,250	3.66	149,713	6.49	84,447
1998/99	242,499	3.42	829,347	3.71	223,303	5.38	154,245
1999/00	244,369	3.61	882,174	3.75	235,246	5.92	149,016
2000/01	164,673	3.82	629,051	3.85	163,390	7.96	79,027
2001/02	167,572	4.38	733,323	3.91	187,551	7.95	92,242

Sources: Export quantities and prices: ALCOTEXA, *The Egyptian Cotton Gazette*, different issues; CATGO; WPI: CAPMAS, *Statistical Yearbook*, different issues; EVI: calculated from CAPMAS; Exchange rate: CBE.

- Notes:
- 1) The nominal value of lint exports is reported in dollar terms by ALCOTEXA from 1998/99 on; before that it was calculated from minimum export prices and export quantities reported by ALCOTEXA in the Cotton Gazette.
 - 2) These nominal dollar values are converted to Egyptian LE at an average monthly exchange rate between the pound and the dollar for the marketing year (September-August).
 - 3) These nominal LE export values are then deflated by the WPI (wholesale price index), where 1986/87 = 100. The annual WPI is calculated as an average of monthly index values for the marketing year from 1990/91 through 2000/01. From 1987/88 to 1989/90, the calendar year index value is used for the first year noted, as historically 80-90% of the export commitments (contracts) are made during the first four months of the marketing year.
 - 4) The nominal LE export values are also deflated by the EVI (export value index), where 1986 = 100. The export value data cover product exports only, not services. The index is calculated for calendar years, as the export value data are only available from CAPMAS for calendar years. Again the index value applied to each cotton marketing year is for the first year (first four months) of the marketing year.
 - 5) The nominal value of lint exports was adjusted upward by \$19.2 million for 1999/00, because ALCOTEXA reported (in its October 2001 *Gazette*) that export volume was 8,166 mt higher, largely due to additional exports of 7,697 mt after the 1999/00 export marketing year officially closed. Actual export shipment figures therefore fully met export commitments.
 - 6) Export figures for 2001/02 are commitments for the period 14 October 2001 through 30 March 2002. Typically, by that point in the season, most export commitments have been made, but not all commitments are shipped until late in the season. In many years, final shipments do not equal final commitments, though it is safe to assume that final shipments will equal or exceed commitments by the end of March.
 - 7) ALCOTEXA value estimates are based on official minimum export prices, which were not always observed. Most transactions in 2001/02 took place at prices below (3-20 cents/lb.) these supposed minimum prices. Hence, it is possible that Egyptian export revenues are mildly overstated, as actual transacted prices were lower in dollars than reported. At the same time, export commitments (and shipments) may increase beyond the end of March 2002 level by the end of the marketing year. MVE calculated an average exchange rate for the first six months of the 2001/02 marketing season to convert dollar export earnings to Egyptian pounds. The deflator in LE terms is also an average of six monthly values.

Figure 1-1: Nominal and Real Value of Cotton Lint Exports, 1986/87 to 2001/02



1b. Real Value of Cotton and Cotton-Blend Yarn Exports

Sources of Information

CAPMAS

TCF

Calculation of Progress Indicator

See definition. Yarn export volumes and values are reported by calendar year. Yarn refers to both 100% cotton yarn, which comprises 84% to 97% of the total volume of cotton and blended cotton/synthetic yarn exports, and blended yarn. Blended yarn generally ranges from 35% to 60% cotton, with the synthetic component usually being polyester.

Results and Analysis

Exports of cotton and blended cotton/synthetic yarn accounted for over 50% of the nominal value of total cotton and blended cotton/synthetic product exports (excluding lint) from Egypt during the early 1990s (note that this calculation excludes cotton lint). *This proportion dropped to 40.7% in 1993 and declined further to 29.7% in 1998 and only 20.5% in 2001.* The value of fabric exports, as a proportion of total textile product exports, also declined from over 15% of the total value in 1990 and 1991 to only 5.3% in 1999. The value of yarn and fabric exports fell at the expense of strongly rising exports of knits, made-ups and woven garments. Only 21% of the total value of textile exports in 1990, knits, made-ups and woven garments comprised 73% by 1999.

This stunning reversal was due to the declining competitiveness of Egyptian yarn exports in international markets during the 1990s, following the “loss” of the principal Soviet market, and the dramatic expansion of private weaving, knitting and RMG manufacture for export throughout the 1990s. Egyptian yarn was uncompetitive largely because domestic public spinners used almost entirely Egyptian cotton lint, paying high prices based on administered and often high lint export prices. Egyptian lint was expensive raw material to spin low- to medium-count yarn, which fared poorly in export markets against cheaper Indian, Pakistani, and other Asian yarn, spun from cheap short-staple cotton. In contrast, the private exporters of woven cloth, knits and RMGs were able to import cheap Asian yarn, without paying customs duties, at prices well below those of Egyptian yarn. Duties were waived, under the temporary admission system, if the manufactured textiles, using this cheap Asian yarn, were exported.

During the period 1993-1999, pure cotton yarn accounted for 88.7% of the volume and 91.5% of the value of pure plus blended cotton yarn exports. In 2000, blended cotton yarn exports were 17.3% of total cotton yarn exports, a high for the period under investigation, as many spinners were substituting cheaper polyester for expensive Egyptian cotton lint to produce cheaper, more competitive blended yarns.

Table 1b-1 shows the nominal and constant currency value of cotton yarn exports during the period 1990-2000. After reaching the highest nominal level of LE 1.3 billion in 1994, the nominal value of yarn exports had dropped 50.6% to LE 643.6 million by 2000. The constant value had fallen even more sharply (by 60.4%). The nadir of yarn export revenue came in 1999, with the year 2000 representing

something of a modest comeback. Since 1994, nominal and real yarn export revenues decreased steadily, with 1997 witnessing a short-lived bounce.

Yarn exports were volatile during the 1990s, particularly after 1993, but they trended downward over the decade (- 3.7% in nominal terms and - 9.3% in constant terms). *A priori*, one might expect lint and yarn exports to increase or decrease in tandem, reflecting changes in the level of seed cotton production. In practice, this has not been the case. Lint and yarn exports were weakly correlated ($r = 0.15$) over the period 1990-1999, comparing calendar year data. When lint exports per market year (September-August) were compared to yarn exports per calendar year (January-December), the correlation was found to be negative ($r = - 0.34$). Although these two periods differ by one quarter, they are probably suitable for purposes of analysis.⁸ A negative relationship between lint exports and yarn exports is plausible, as increased exports of lint may make less lint available for domestic spinners, who will then produce and export less yarn.

The relationship between cotton production and lint exports was rather weak ($r = 0.26$), but it was much stronger ($r = 0.66$) between total lint supply (production plus carryover) and exports. Although the level of carryover stocks from one marketing season to the next is in part a function of seed cotton production in the prior year, world market conditions and policy variables are also important, particularly price policy decisions. High ALCOTEXA lint export prices have led to poor sales in some years (especially 1996/97) and have exacerbated the build-up of stocks. When lint export prices have been high, into-mill lint prices faced by domestic spinners have also been high, which has dampened demand for Egyptian lint. TCF's minimum yarn export prices, ostensibly set by an industry committee (comprised of almost entirely public spinning company chairmen and holding company officials), also affect the level of yarn exports, although exogenous world yarn supplies, exports from competitors and their (generally lower) prices influence Egypt's yarn export levels. Slow exports of Egyptian yarn can lead to decreased demand by domestic spinners for Egyptian lint (and hence overall reduced domestic utilization of Egyptian lint). This has been an important contributing factor to declining domestic consumption of Egyptian lint and the increased availability of lint for export.

The total value of cotton and blended yarn exported in 1996 dropped sharply, relative to 1994 and 1995, due to the sharp increase in the prices of raw cotton during the 1995/96 season and the concomitant increase in the prices of cotton yarn. This dampened foreign demand for Egyptian yarn exports.⁹ The total value of cotton and blended yarn exports strengthened in 1997, when the volume

⁸ Egyptian cotton is harvested from September through mid-November. By the time the seed cotton is sold at the sales rings, moved to the gins, ginned, and ready to sell as lint to domestic spinners, one to three months have elapsed. Hence, domestic spinners begin receiving their initial lint shipments from the new cotton crop no earlier than mid-October and as late as January.

⁹ Domestic spinners, particularly public companies, can use the yarn they produce as an input into weaving, knitting and manufacture of RMGs. In theory, high minimum export prices for yarn, set by TCF, could lead domestic spinners to use the yarn as an input into their own integrated operations (i.e., weaving and RMG units) or sell it to other public companies doing weaving, knitting or RMG production. MVE does not have access to time-series data on domestic public spinners' yarn production, utilization of this yarn in their own operations, sales to other domestic textile firms (public vs. private), and exports. Without this disaggregation, we do not know if periods of high minimum yarn export prices (and low export levels) coincide with periods of greater

of yarn exports returned to 1995 levels, but then dropped in 1998 and 1999, reaching the lowest level in nominal terms (LE 505.4 million) during the decade of the 1990s. Both the volume and nominal and real values of yarn exports increased slightly in 2000, though they remained below the levels of the 1990s before 1999 (1990-1998). Nominal export volume slid 15.8% to 7,300 mt in 2001, although the nominal value fell proportionally less (9.6%). Hence, average unit values rose 13.8% from 2000 to 2001, where the unit values per mt of yarn exported were the lowest during 2000/01 and 2001/02 of the APRP period.¹⁰

The main problem facing the Egyptian spinning industry in the second half of the 1990s and at the beginning of the 2000s was tough competition in the international yarn market, combined with the high cost of using Egyptian cotton lint as the main input into domestic spinning (equal to 60-70% of the variable cost of spinning, according to most Egyptian spinners). The inefficiency of the public spinning industry was, of course, a contributing factor. More importantly, Egyptian cotton lint, a high-quality and expensive raw material, has been used to spin low counts of yarn, generally used to produce cloth, knits and garments of low- to medium-quality for everyday use. This under-spinning of Egyptian lint has meant that costly, high-quality raw material has been used to produce low- to medium-value and quality textile products intended for consumers with modest incomes. Foreign spinners who use Egyptian lint have a very different strategy; they typically mix Egyptian lint in with other, somewhat lower-quality types of lint to produce high-quality and -count yarn used in making high-quality finished products—linen, 100% fine cotton shirts and blouses, scarves, bath towels and other goods—which can be sold at premium prices in high-income markets.

In addition to competition in the international market, domestic spinners report heightened competition in the domestic yarn and fabric markets. This is allegedly due to smuggling of cheaper foreign fabric and RMGs, as well as leakage of cheaper foreign yarn, spun from shorter-staple cotton and imported under the duty drawback and temporary admission schemes, into the domestic market. Both competitive pressures in the domestic and foreign markets have led to a progressive decline in domestic spinning capacity. Key informants estimate that half of the domestic industry's capacity of the early 1990s has been idled or liquidated. Domestic consumption of Egyptian lint cotton averaged 5.496 million lint kentars from 1990/91 to 1993/94. It had fallen to 3.734 mlk in 1998/99 and then 2.882 mlk in 1999/2000, which was only 52.4% of domestic utilization of Egyptian lint cotton during the early 1990s. To the extent that this is a proxy for capacity utilization in the domestic spinning industry, it supports the view that only half of the industry's installed capacity is being utilized.

Deliveries of Egyptian lint to domestic spinners for the 2000/01 season were only an estimated 2.71 mlk. Egyptian imports of Syrian and Sudanese lint, estimated at 575,000 lk in 2000/01, were the

domestic use of the yarn in other textile operations.

¹⁰ Yarn unit export values are calculated across yarn types (ring vs. open-end yarn) and counts, so they should be compared across years with caution. They are based on TCF minimum export prices for different types/counts of yarn, which were lowered from 1997 through 2000. TCF minimum prices were raised in 2001, but much of the increase in export unit values can be attributed to exports of higher count (more valuable and more expensive) yarn.

highest since 1994/95, when 800,000 lk of American cotton were imported. Total utilization of Egyptian and imported lint was therefore about 3.28 mlk.

Table 1b-1: Cotton and Cotton-Blend Yarn Exports, 1990-2001

Year	Export Volume (mt)	% Total Volume	Nominal Value (LE '000)	% Total Value	Nominal Unit Value (LE/mt)	Wholesale Price Index (1986/87=100.0)	Total Export Value, in Constant 1986/87 Terms (LE '000)
1990	76,237	68.8%	917,720	62.9%	12,038	214.1	428,641
1991	80,585	66.4%	906,670	54.9%	11,251	252.4	359,219
1992	69,224	67.0%	912,461	53.2%	13,181	283.7	321,629
1993	65,656	57.1%	751,728	40.7%	11,449	305.4	246,145
1994	110,739	63.5%	1,303,978	48.2%	11,775	305.2	426,254
1995	71,024	52.3%	1,107,437	40.4%	15,592	324.4	341,380
1996	47,665	42.5%	726,821	29.7%	15,249	351.6	206,718
1997	68,110	50.9%	991,514	34.8%	14,558	366.5	270,536
1998	49,905	46.3%	778,914	29.7%	15,608	371.4	209,724
1999	35,736	39.5%	505,394	21.5%	14,142	374.7	134,880
2000	46,182	39.6%	643,624	21.8%	13,937	381.4	168,753
2001	38,991	38.1%	618,278	20.5%	15,857	385.3	160,449

Sources: Exports: TCF, *Quarterly Report*, different issues;

WPI: CAPMAS, *Statistical Yearbook*, different issues.

Notes: 1) Total volume refers to the total volume of exports of all cotton and cotton/synthetic blend products. Total value refers to the total value of exports of all cotton and cotton/synthetic blend products. 2) The data for 1990-1992 come from El Sayed Dahmouh and Edgar Ariza-Nino (1997 and 2001), who "massaged" TCF estimates. The data from 1993 to 2001 are unedited TCF figures.

Yarn exports in 2001 dropped from the somewhat higher year 2000 level to about 39,000 mt, while export earnings of LE 618.3 million approached earnings in 2000. Average yarn exports of the early APRP period (1995-1998) were 59,176 mt per year on average, despite considerable year-to-year variability, and nominal export earnings (in LE) were no lower than LE 727 million per year. Nominal unit values of yarn export prices averaged over LE 15,000/mt in three of four of these years. During the later APRP period, 1999 through 2001, yarn exports averaged 40,303 mt/yr, 32% lower than the earlier APRP period. Nominal export earnings (in LE) did not exceed LE 643 million per year during 1999-2001, well below the average nominal level of LE 901 million per year for 1995-98. Nominal

unit values of yarn export prices dropped to only about LE 14,000/mt in 1999 and 2000, before increasing significantly to LE 15,857/mt in 2001, largely on the strength of exports of more higher count yarn than in earlier years. Nevertheless, total yarn export value decreased significantly from the first six years of the 1990s (1990-1995) to the end of the decade, with constant values especially low in 1999-2001.

2. PRIVATE SECTOR SHARE OF DISTRIBUTION OF NITROGENOUS FERTILIZER

Definition of Progress Indicator

This indicator is defined as the share of the domestically produced nitrogenous fertilizer that is sold by the producing factories to private entities.

Relationship of Progress Indicator to Reforms under APRP

Under APCP and under tranches I and II of APRP, there were significant efforts to ensure that the wholesale and retail trade of fertilizer be open to participation by the private sector. This indicator measures whether that is the case.

Beginning in 1989 direct production subsidies on fertilizer were eliminated. In July, 1991, subsidies to PBDAC on distribution were eliminated¹¹ and fertilizer distribution by the private sector was legalized.¹² During the fertilizer “crisis” of 1995 and 1996, however, distribution of domestically produced fertilizer was removed from private control and returned to PBDAC. Since that time, PBDAC’s share has again declined.

Sources of Information

Abu Qir company

El Nasr company

PBDAC

MPE, Fertilizer Bureau

Calculation of Progress Indicator

See definition.

Results and Analysis

The removal of subsidies in the late 1980s and early 1990s allowed the private sector to become active in chemical fertilizer distribution in Egypt. Private traders both re-sell fertilizers to retailers located at the regional or village levels and sell directly to relatively big farmers.

By July, 1992¹³ Only one year after legalization Private sector traders dominated the market. By December, 1992 there were over 6,000 private fertilizer dealers in Egypt; they handled about 60 percent of fertilizer distribution (IFDC, 1993, cited in Zalla and Saad, 1999, p. 9).

By 1995 the fertilizer market had been transformed into a competitive market with minimal presence of the public sector. There was a reversal of this trend in 1995, however, when the Government

¹¹ El Guindy et al., “Marketing and Price Policies for Nitrogen Fertilizers in Egypt,” APRP RDI Unit Report No. 22, December, 1997, p. 68.

¹² World Bank, “Arab Republic of Egypt: An Agricultural Strategy for the 1990s,” Report No. 11083-EGT, December, 1992, p. 63.

reintroduced the monopoly of PBDAC with respect to domestically produced nitrogen fertilizer. Exports from the producing factories, decreased production due to simultaneous shutdowns for maintenance at more than one factory, and import duties brought on a “crisis” in nitrogenous fertilizer supplies and prices. The GOE temporarily exempted fertilizer from duties, and large quantities of imports flowed in. Since then the private sector has gradually regained its position as the dominant distribution channel for chemical fertilizers.

The results (see Table 2-2 and Figure 2-1) illustrate the effect of the reforms and the crisis. The private sector’s share increased from zero at the beginning of the decade to about 70% in the summer of 1995, after which PBDAC became the only entity to receive fertilizer from the factories. When the effects of the “crisis” receded, the Bank’s share was gradually reduced, so that for 1999/00, the share of the private sector had returned to more than 75%. PBDAC has continued to purchase around 10 percent of the nitrogenous fertilizer sold by the factories, despite having had significant stocks recently. The share of the cooperatives declined from 1996/97 to 1999/00, but it bounced back to 18.5 percent in 2000/01, comparable to the earlier level.

Table 2-1 shows that production of nitrogenous fertilizer more than doubled from 1990/91 to 2000/01, mainly through increases in the production of urea and AN. The increase in urea production is largely due to a new factory, Abu Qir 3, which opened in the latter half of 1998/99 but only reached full production in 1999/00. Domestic urea output expanded significantly from a four-year average of 2,909 thousand mt (in 1995/96 through 1998/99) to 4,897 thousand mt in 1999/00 and 6,327 thousand mt in 2000/01. Production of ammonium nitrate actually declined slightly from the three-year (1994/95 to 1996/97) high of 3,336 thousand mt to 3,095 thousand mt in 1999/00 and 3,140 thousand mt in 2000/01.¹³

The private sector share in fertilizer distribution (see Table 2-2) reached a high point of 76.6% in 1999/2000, having expanded from a mere 3.5% in 1995/96 and 4.1% in 1996/97. The private sector’s share actually declined 7.8 percentage points to 68.8% in 2000/01, while the cooperatives’ share rose 5.8 percentage points to 18.5% and PBDAC’s share increased 2.7 percentage points to 11.9%. Taking the shares of the private traders and cooperatives together as an expanded private sector share, this share varied little from 1998/99 (89.8%) to 1999/00 (89.3%) to 2000/01 (87.3%). The combined PBDAC and public sector share has remained low (10.1% -12.6%) during the past three fertilizer distribution periods (1998/99 to 2000/01).

However, in February 2002, the GOE issued instructions to the producing factories to increase the share of PBDAC to 30% by reducing the share of the private sector to 50%. Within the following month, New instructions were issued to increase the share of PBDAC to 50% while decreasing the share of the private sector to only 30%. The reasons mentioned for the change in the GOE policy include:

- Increased exports by the private sector due to increased world prices
- Increased prices paid by farmers for these fertilizers

¹³ Ammonium nitrate fell 6.0% between 1994/95-1996/97 and 1998/99-2000/01.

Table 2-1: Domestic Production of Nitrogenous Fertilizers, 1989/90 to 2000/01

(‘000 mt, 15.5% Nitrogen Equivalent)

Year	Urea	AN	CN	AS	Total
1990/91	2,742	1,256	226	84	4,308
1991/92	2,594	2,418	212	89	5,313
1992/93	2,481	2,890	95	89	5,555
1993/94	2,763	2,903	107	93	5,866
1994/95	2,721	3,231	25	89	6,067
1995/96	3,107	3,411	5	104	6,626
1996/97	3,089	3,365	0	124	6,578
1997/98	2,882	3,127	0	86	6,095
1998/99	2,558	3,173	0	85	6,816
1999/00	4,897	3,095	0	113	8,105
2000/01	6,327	3,140	0	101	9,569

Source: Ministry of Public Enterprise, Fertilizer Council, unpublished data.

Table 2-2: Distribution Shares of Nitrogenous Fertilizer, by Sector, 1989/90 to 2000/01
(Percent)

Year	PBDAC	Public Sector ^b	Total Public Share	Private ^a	Cooperatives
1990/91			100.0	0.0 ^c	
1991/92	48.3	9.0	57.3	24.7	18.0
1992/93	24.8	0.0	24.8	60.4	14.9
1993/94	13.5	1.8	15.3	63.7	20.9
1994/95	8.6	0.5	9.1	70.7	20.2
1995/96^d	94.2	0.9	95.1	3.5	1.3
1996/97	59.1	17.7	76.8	4.1	19.1
1997/98	17.6	4.4	22.0	59.2	18.8
1998/99	8.6	1.5	10.1	74.8	15.0
1999/00	9.2	1.4	10.6	76.6	12.7
2000/01	11.9	0.7	12.6	68.8	18.5

Sources: Ministry of Public Enterprise, Fertilizer Council, unpublished data; *Fertilizer Policy Impact Study* (Final Report), International Fertilizer Development Center, June 1993; Zalla and Saad, *Fertilizer Subsector Baseline Study*, 1998.

Notes:

^a Most of this fertilizer goes to the domestic market; a very small part is exports.

^b These are public companies that receive fertilizer from the factories, earn a commission, and resell to wholesalers. See Zalla and Saad (1998).

^c It was illegal for the private sector to distribute fertilizer before July, 1991.

^d From August 5, 1995 through December, 1995 PBDAC handled 100% of the nitrogen fertilizer. This estimate does not cover the period from July 1 to August 4, 1995.

3. PRIVATE SECTOR SHARE OF VOLUME OF SEED COTTON TRADE, GINNING, AND SPINNING

Definition of Progress Indicators

These indicators are defined simply as the share going to the private sector of the trade and processing of cotton products, namely seed cotton, lint, and yarn. Each indicator shows the amount of the activity carried out by private agents as a proportion of the total. In the case of yarn, the indicator is based on data that include both pure cotton yarn and cotton/synthetic blends.

3a. Private Sector Share of Volume of Seed Cotton Trade

Relationship of Progress Indicator to Reforms under APRP

Under APRP, and before it APCP, the GOE has been working toward a cotton marketing system in which the private sector plays the dominant, if not the exclusive role. It has used both privatization and liberalization to accomplish this goal. The private sector was allowed to enter into seed cotton marketing and ginning in 1994/95. These indicators show directly whether this goal has been achieved in the specific areas of seed cotton marketing, ginning of seed cotton into lint, and spinning of lint into yarn.

Sources of Information

CATGO

Cotton textile holding companies

ALCOTEXA

Private ginning companies

MVE survey of private spinners

Calculation of Progress Indicator

The measurement of these indicators is fairly straightforward. The only choices for calculation are whether to use the input or the output side of the processing operations. For ginning the data are the quantities of lint produced, and for spinning the indicator measures the amount of yarn produced. These choices were dictated by the availability of data, but they do not introduce any significant bias into the results.

Results and Analysis

Table 3a-1 shows the volatile nature of this indicator, which has been influenced directly by the Government's policies. It should be stated first that because of the structure of the seed cotton market in Egypt, this indicator is always an *understatement* of the actual participation of the private sector. That is, seed cotton is usually sold by producers in "rings" operated by PBDAC, and it is also sometimes sold outside of those rings. Sometimes commission agents or traders—both registered and unregistered—buy the seed cotton from farmers and bring the cotton to larger trading companies, both public and private. These companies have the cotton graded in their name at the ring and then move the cotton to the gin. This indicator measures the seed cotton that arrives at the gins. By this time, some of the cotton has changed hands more than once, sometimes going from private ownership to

public, whereas in the seed cotton form, it never goes from public ownership to private. The indicator is presented in the deliveries form because data are available for many years, whereas special efforts need to be made to estimate the share of seed cotton bought, and these data are not consistently available for the early years of private seed cotton trading.

In 1994/95 the seed cotton marketing arena was opened to the private sector, which took an encouraging 30-percent stake in these activities. Participation by the private sector started with one main buyer (El Ahly Co.), which also leased a number of public gins, and two other companies. The following year showed an even more remarkable 53-percent share for private companies. This growth in private participation came through an increase in the number of private companies participating, which reached about a dozen¹⁴. This large increase came despite a ban on exports of lint that lasted until February, 1996. The Government sought to meet the needs of the domestic spinning mills first. Exports in 1995/96 were the second lowest in the decade; only ELS varieties were allowed to be exported.

In 1996/97, the private sector was hit with the impact of the Government's efforts to give farmers a high price for their seed cotton. The GOE estimated the support price based on what turned out to be a temporary spike in world cotton prices in early 1996. The private sector did not participate at all that year, because the floor prices were higher than world prices. Private sector representatives asked for a mechanism to compensate them for the difference between the two prices, but the reply came only in the following year.

In the fourth liberalized season, 1997/98, private sector deliveries of seed cotton to gins were limited to about 5% of the crop. There were only three private buyers, two of them S Modern Nile Company and Arab Ginning Company S under one group; the third buyer was Arab Trade and Investment Company.¹⁵ Floor prices were again higher than world prices, but, partly on the advice of APRP, the GOE instituted a deficiency payment scheme to compensate traders for the difference. Unfortunately the scheme was developed too late in the season to be implemented successfully. It also included a prohibitive requirement for the private companies to make large cash deposits before starting their marketing activities, a requirement that did not apply to public sector companies.

In 1998/1999 at least eleven major private sector companies participated in seed cotton marketing and at least 66 smaller registered and non-registered private traders participated (see Holtzman and Mostafa, 1999). In this year, the GOE did not announce a floor price before planting, but eventually declared that it would be the buyer of last resort and tied the support price to the opening export prices of lint announced by ALCOTEXA. Prices for some export cottons were sufficiently reasonable that the private sector returned to the marketing arena with a 20-percent share. That is, at these prices the

¹⁴The dozen figure refers only to companies that actually delivered to gins; more actually bought seed cotton (58 of the sample of 74 from the 1998/99 trader survey).

¹⁵In a survey of 74 seed cotton traders in November-December, 1998, MVE learned that 21 sample traders bought 50,700 seed kentars in 1997/98. Excluding one large trader, who became an ALCOTEXA member in 1998/99, these 20 companies bought 20,700 kentars of seed cotton (though they generally do not appear in statistics regarding deliveries to the gins).

private sector could compete with public trading companies, who were also buying seed cotton, and make a profit.

In 1999/00 the private share, as defined by deliveries to the gins, reached 37% (see Krenz and Mostafa, Impact Assessment Report No. 11). In fact the private sector bought about 45% of the seed cotton from farmers, but sold some of it to public sector companies, which then delivered it to the gins.

During the 1990s the Government opened seed cotton marketing to the private sector by changing the marketing system. Previously PBDAC or cooperatives had operated all marketing rings (where farmers had been required to deliver their seed cotton). In 1994/95 seed cotton was sold in cooperative collection centers, and PBDAC played a very small role in the system. A similar system was used in 1995/96. From 1996/97 on, PBDAC returned to the marketing system in a significant way as the administrator of the marketing rings. In that year (1996/97) of high prices, the private sector did not accept the Government's offer of marketing rings, because the mechanism for compensation for paying fixed prices above world prices levels was not clear. The following year, 1997/98, the private sector was given first choice of rings, and it chose to buy seed cotton in 55 rings out of the 857 rings in the country. In 1998/99, the private sector again had first choice among the rings. Despite some uncertainty during the production season about the Government's plan for price interventions, by the end of the season the plan became clear, and the private sector chose to buy in about 150¹⁶ out of the total of 892 rings.

The area cultivated to cotton in 2000/2001 was about 518,000 feddans, which was the lowest during the last century. The allocation of rings by PBDAC generated complaints from most of the cotton traders as the share of the Horticultural Services Unit was 26% of the crop. The Cotton Marketing Supervisory Committee allocated 209 sales rings to private companies in 2000/2001 (25.9% of the total rings), of which 135 were operated by ALCOTEXA members, 61 by other registered traders, and 13 by private spinners.

The actual private sector share of deliveries to gins of 36.2% was higher than the private share of PBDAC sales rings for several reasons. First, the largest private traders (and one private spinner) bought 601,283 sk of seed cotton from cooperatives, which they then delivered to the gins. This represented nearly half (47.5%) of private sector purchases. In addition, MVE estimates that registered private trading companies bought 151,316 sk (12.0%) outside the PBDAC rings from other, smaller traders, directly from producers, and at a number of privately-run sales rings. In addition, there were ten registered or formerly registered cotton traders who delivered 53,514 sk (4.2%), bought outside the PBDAC rings, to the gins. Therefore, private traders bought 205,900 sk outside the GOE's Optional Cotton Marketing System, which were then delivered to the gins. Added to the 458,956 sk bought through PBDAC sales rings (36.3 % of private sector purchases), the purchases outside the

¹⁶The actual number is 149, plus the number of private rings in Fayoum, data for which data were not available.

rings significantly increased the private sector share of deliveries to the gins. Total private sector purchases reached 1,265,069 sk.¹⁷

Note that deliveries to the gins are not the same as first purchases of seed cotton. There were numerous, small non-registered cotton traders who bought seed cotton directly from farmers and sold it mainly to larger private sector traders (though there were occasional sales to public sector traders and ginneries). In a year such as 2000/01, when seed cotton prices outside the PBDAC rings were higher than prices at the rings for several varieties in high demand (Giza 86, 70, 85), widespread participation of small, non-registered cotton traders is encouraged. The proportion of actual first purchases by private traders (of all types) and cooperatives (buying for private traders) is somewhat higher than the private sector share of deliveries to gins, because some type of cooperatives (Agrarian Reform, Land Reclamation) sell about half (51.9% in 2000/01) of their seed cotton to public trading companies.

During the 2001/02 marketing season, there have been fewer purchases of seed cotton outside PBDAC sales rings, as buyers at rings offered higher prices for most varieties. In addition, fewer private companies have delivered seed cotton to the rings in 2001/02 (n=36) than in 2000/01 (n=55). The private sector share of deliveries to the gins decreased slightly to 31.3% in 2001/02, falling short of the 36-37% level of the past two marketing years (1999/00 and 2000/01). Note, however, that the volume of private sector deliveries, 1.65 million seed kentars, was the highest during APRP and second only to the 2.15 million seed kentar level of 1995/96. Hence, private traders remained very active, though they bought proportionally less of the largest seed cotton crop since 1997/98 than in 1999/00 and 2000/01.

¹⁷ The discrepancy between this figure and the one in Table 3a-1 derives from MVE use of multiple, sometimes conflicting disaggregated data, used in this paragraph's discussion, and summary CATGO data. The most notable discrepancies exist between CATGO and PBDAC data on seed cotton purchases and estimates of purchases of different types of buyers outside PBDAC sales rings (and not from cooperatives).

**Table 3a-1: Deliveries of Seed Cotton to Gins, Private Companies and Total,
1990/91-2000/01**

(seed kentars)

Marketing Year	Private Deliveries	Total Deliveries	Private Share (percent)
1990/91 - 1993/94	0		0
1994/95	1,331,413	4,317,219	30.8
1995/96	2,146,586	4,061,843	52.8
1996/97	7,410	5,761,146	0.1
1997/98	296,181	5,841,666	5.1
1998/99	782,260	3,985,357	19.6
1999/00	1,438,430	3,920,795	36.7
2000/01	1,258,470	3,476,855	36.2
2001/02	1,653,149	5,289,092	31.3

Sources: 1990/91-1998/99: CIT-HC, "*Cotton*," different issues; 1999/00: CATGO, *Annual Report*; 2000/01 & 2001/02: periodic CATGO bulletins.

Notes: 1) There are some minor discrepancies among sources. While the figures in Table 3a-1 are from summary CATGO reports, the discussion on the previous page is drawn from disaggregated data from multiple sources.
2) The 2001/02 data appear to be final, having been reported at the same levels in CATGO's *Weekly Report on the Activities of CATGO, 2001/02* since 18 March 2002.

Beginning in 2001/02, CATGO provided a breakdown of first purchases by venue of the Egyptian seed cotton crop, in addition to providing the customary information on delivery of seed cotton to the gins. These data do not provide a public/private breakdown and need to be supplemented by PBDAC data, disaggregated by public and private buyers, to be interpreted clearly. Nevertheless, the comparison between the past two years is instructive. One clear conclusion that emerges from the data presented in Table 3a-2 is that the total cooperative share increased from 30.7% to 33.1%, with the coops assembling one-third of the crop in 2001/02. Purchases in private sales rings also nearly doubled, while this venue represented a slightly higher 6.7% of the market than the 5.7% of the previous year. HSU's market share declined 4.1 percentage points, from 22.3% to 18.2%, while 0.9% more of the seed cotton crop was bought at PBDAC rings in 2001/02 than in 2000/01.

Figure 3-1: Private Sector Share in Seed Cotton Trade, 1994/95 to 2001/02

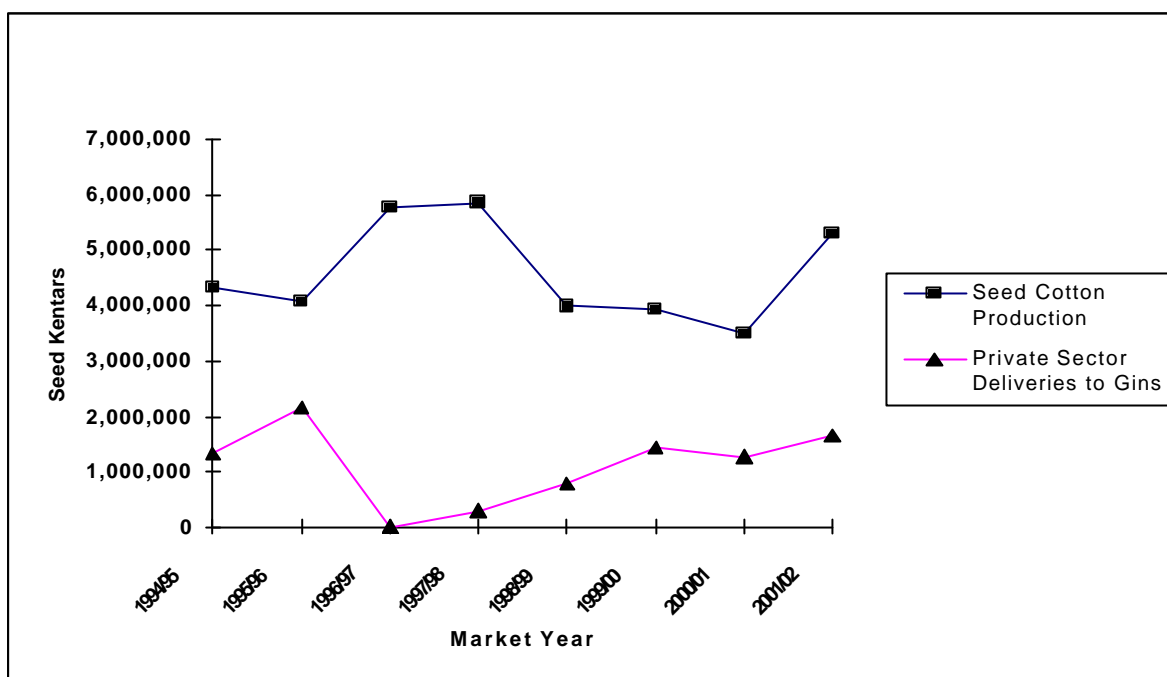


Table 3a-2: Breakdown of First Purchases of Seed Cotton, by Venue and Buyer Category, 2000/01-2001/02

Buyer Category	2001/02		2000/01		Change in Market Share
	Total Purchases	% Total	Total Purchases	% Total	
PBDAC Sales Rings	2,036,798	38.5%	1,305,586	37.6%	0.9%
HSU	963,285	18.2%	772,251	22.3%	-4.1%
Private Stores	181,039	3.4%	127,986	3.7%	-0.3%
Agrarian Reform	814,351	15.4%	594,064	17.1%	-1.7%
Land Reclamation	271,495	5.1%	180,691	5.2%	-0.1%
Field Crop Coops	665,152	12.6%	290,771	8.4%	4.2%
Subtotal, Coops	1,750,998	33.1%	1,065,526	30.7%	2.4%
Private Sales Rings	356,972	6.7%	197,248	5.7%	1.1%
Total	5,289,092	100.0%	3,468,597	100.0%	

Source: CATGO *Report of Weekly Activities*

- Notes:
- 1) Private stores belong to large producers.
 - 2) Most of the seed cotton assembled by coops is sold, as seed cotton, to large traders, who then deliver it to the gins. Hence, coop seed cotton purchases do not show up in CATGO gin delivery figures.
 - 3) Privately-run sales rings (or collection centers) appear under "Private Sector." CATGO provided grading services directly to those private rings in 2001/02.

3b. Private Sector Share of Volume of Cotton Ginning

Relationship of Progress Indicator to Reforms under APRP

Under APRP the GOE has undertaken to privatize the ginning industry. Two ginning companies have been privatized. This indicator shows the results of those privatizations and the results of new investment in ginning by measuring the amounts of lint produced by private gins as a share of the total.

Sources of Information:

Holding Company for Cotton and International Trade (through June 2000)

HC-SWRMC

CATGO

Calculation of Progress Indicator: See definition.

Results and Analysis

During the period 1961-94, all cotton trading, ginning, spinning, weaving and exporting in Egypt were carried out by the Government. Thus before 1996 the five cotton ginning companies were owned by the public sector, and seed cotton was allocated administratively by the Holding Companies to different gins.

In October 1996, Arab Ginning was sold to private investors. Nile Ginning was also privatized shortly after that (spring 1997). Reflecting these successful privatizations¹⁸ and other investments and leases by the private sector, the private sector's share of cotton ginning increased from zero in 1993/94 to nearly 40 percent in 1998/99. Since then, it has fluctuated, reaching a high of 41.6 percent in 2000/01 but dropping back to about one-third (33.7%) in 2001/02. Private ginners report that the Spinning, Weaving and Ready-Made Clothes Holding Company (SWRMC-HC) issued instructions to the public trading companies to use public ginning companies if possible during the 2001/02 season, which is responsible for the eight percentage point loss in market share. If this unwritten SWRMC-HC policy is retained for future years, it could continue to limit the share of the private ginning companies to a third of the cotton crop or less. As evidence of GOE interference in the ginning market, it would also likely dampen any investor interest in either privatizing the three remaining public ginning companies (or parts thereof) or in investing in any new gins.

There have been no further privatizations of public ginning companies since 1997, although two of the remaining public ginning companies have been put out unsuccessfully for bids. The private share of ginning will not likely increase much beyond 40 percent until further privatizations take place. The ginning companies have charged a uniform LE 18.5/lk for the past four years; ginners are able to differentiate their "products" largely on the basis of services offered: quality of cleaning, ginning, and baling. Some ginners offer to share transport costs as well. Nevertheless, individual gins are only allowed to gin one variety during an entire season; the assignment of varieties to gins is done administratively by the Holding Company, in consultation with the MALR, which determines the variety map each year. The bottom line is that there is limited competition, largely on services, among ginners,

¹⁸See Krenz and Mostafa, Special Study No. 3.

though the market is a rather highly regulated one. The continued overcapacity in the ginning industry is one factor that keeps the charge for ginning services low.

The one gin/one variety restriction and GOE assignment of varieties to gins deserve further comment and clarification. Entire districts (and sometimes governorates) are cultivated to one and only one variety. Gins in those districts generally gin only the variety that is grown in those districts. This makes economic sense, as it minimizes transport costs, though it ignores quality differences in ginning services between gins.¹⁹ While gins in countries such as the United States may gin more than one variety, this is not practiced in Egypt, partly because there is excess ginning capacity. A more important reason, however, is that the MALR and the SWRMC-HC wish to avoid varietal mixing through ginning more than one variety at particular gins. GOE experts argue that gin management and cleanliness (referred to in the U.S. as “good house-keeping practices”) in Egypt are not currently at a high enough level to permit ginning of more than one variety per gin.

¹⁹ An Egyptian cotton trader might be willing to pay higher transport costs to ship his seed cotton to a gin that offers better ginning services and is capable of producing higher-quality lint (with better spinning characteristics). In this case, the higher transport costs (which might be shared by the ginner) would be offset by the higher value of the lint output (than what would be achieved at a less well-performing gin).

Table 3b-1: Cotton Ginned by Ginning Company (Lint & Scarto), 1990/91 - 2001/02

(lint kentars)

Company	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Al Ahli***	0	1,101,60	1,015,78	572,125	0	0	0	0	0
Modern Nile***	0	11,710	36,769	0	0	0	0	0	0
Nefertiti***	0	168,824	137,781	170,300	104,159	51,634	32,717	0	18,255
Egypt***	0	0	23,033	12,900	0	0	0	5,316	5,304
Arab Ginning**	1,707,10	623,357	682,915	898,286	1,290,440	940,800	892,281	899,041	1,087,256
Nile Ginning**	1,735,42	988,958	959,858	1,011,10	990,399	822,689	754,073	835,761	1,009,665
Delta Ginning	1,964,65	879,962	991,221	1,463,16	1,541,761	*1,051,19	1,238,978	1,063,424	1,700,198
Misr Ginning	1,609,99	933,808	469,426	1,328,78	1,524,318	971,179	755,526	684,307	1,271,044
El Wadi Ginning	1,283,37	771,792	499,328	1,402,76	1,376,135	741,264	900,589	691,790	1,198,561
Total	8,300,55	5,480,01	4,816,11	6,888,04	6,827,212	4,578,760	4,457,164	4,179,639	6,290,282
Private Sector Share (cotton ginned in privately owned gins)	0	0	0	898,286	2,280,839	1,815,123	1,673,071	1,740,118	2,120,480
Percent	0	0	0	13.0	33.4	39.6	36.6	41.6	33.7
Private Sector Share (cotton ginned in privately owned/leased gins)	0	1,282,135	1,213,370	1,653,611	2,384,998	1,815,123	1,673,071	1,740,118	2,120,480
Percent	0	23.4	25.2	24.0	34.9	39.6	36.6	41.6	33.7

Source: CIT-HC, "Cotton," different issues. CATGO annual reports (through 1999/00) and summaries of weekly activities (2000/01 and 2001/02).

Notes: Above the heavy line contains cotton ginned under private ownership or lease.

*Nassco had a contract with Delta Ginning from 1998/99 to 2001/02 to gin its seed cotton and to use cleaning and pressing lines so Nassco could export directly from the gins, but none of this cotton is included as private because the gin is public.

**Arab Ginning and Nile Ginning were public sector companies until privatized in 1996/97 and 1997/98, respectively.

*** These private companies leased and managed public sector gins for several years beginning in 1994/95. Nefertiti had a five-year contract with Nile Ginning, which expired at the end of the 1998/99 ginning season, and Nile was privatized during this time. Cotton ginned by Nefertiti is included under privately leased in all five years. As of 1998/99, Nefertiti also operated its own gin. The breakdown of the cotton ginned by Nefertiti in 1998/99 is as follows: 32,971 lk (leased), 18,663 lk (owned).

Figures for 2001/02 are based on seed cotton deliveries to the gins as of 4th June 2002; seed kentars are converted to lint kentars at the national average out-turn ratio of 119.3% for the ginning season to that point (99.6% of the cotton had been ginned). The GOE Sakha gin (15,302 sk) is excluded from the totals and calculations, as it gins cotton produced on state farms in order to obtain seed for multiplication for the following year's crop.

3c. Private Sector Share of Volume of Cotton Spinning

Relationship of Progress Indicator to Reforms under APRP

Under APRP the GOE has begun the privatization of spinning mills. In addition, a substantial number of private investors have entered this industry. An MVE survey in 1999 discovered about twenty private spinners of relatively large scale, in addition to more than one hundred smaller companies operating in the Fowah area using various types of cotton waste as input. The indicator shows the effects of the privatization and private investment as measured by the amount of yarn produced.

Sources of Information

MVE private spinner surveys, 1999-2001

CAPMAS

CIT-HC, TMT-HC, SWRMC-HC

Calculation of Progress Indicator

See definition.

MVE conducted a survey of private cotton spinners in May and December 1999, and again in December 2000-January 2001 and November 2001-January 2002. Of the 35 spinners surveyed in 1999, 12 companies in Fowah are traditional spinners. In addition to the 12 spinners from Fowah, the survey covered 20 modern private spinners (5 privatized companies, 2 ring spinners and 13 open-end spinners). In updating the survey in 2000, the Unit found no additional cotton spinners operating, but four spinners had left the sample because they were spinning synthetics only. This is due to higher prices for cotton, relative to polyester, in 2000/01 compared to earlier years, and very limited domestic cotton lint supplies. By 2001/02, a couple of new open-end spinners were scheduled to begin operations, but those spinners who had shifted to spinning synthetic fiber had not switched back to cotton, given relative prices that continued to favor using synthetics.

Results and Analysis

Table 3c-1 shows the share of the private sector in cotton and cotton-blend yarn spun in Egypt. The share increased from 7.8 percent in 1992/93 to 40.1 percent in 2000/01. This accompanied the increase in the number of companies. In 1990/91 there were about 70 companies operating in Fowah and about five other private spinners in production in Egypt, according to the MVE spinner survey. By 2000/01 these numbers had increased to over 170 in Fowah and 20 private spinners.

In this third and final *Monitoring Report*, MVE is able to include data on yarn production by the two joint investment companies. MVE obtained detailed statistics on the output of the joint investment spinners from the SWRMC-HC very near the end of the APRP project, which allowed the Unit to include this category in Table 3c-1 and to calculate the shares of the public spinning companies, the joint investment companies, and the private spinning companies more accurately than in previous years. MVE considers that these two companies, Misr Amriya and Miratex, operate more like public sector

spinners than private sector enterprises.²⁰ These companies have a different status than the public sector spinning companies or private spinners. They are Law 230 companies that are sometimes characterized as private sector firms in GOE statistics but which are owned by public entities (banks, insurance companies, other GOE and foreign government entities).

In estimating private sector yarn output, we estimated the output of traditional, small-scale production units in Fowah in the Northern Delta (near Alexandria). These estimates should be taken as approximations, based on sample survey findings (n=12) but where a number of assumptions about how to apply those findings to the estimated population that went from n=120 in 1997/98 to n=176 in 2000/01. The estimated numbers of Fowah firms have been obtained from a business chamber in that district. Since Fowah output was estimated to be 80.6% as large as non-Fowah private sector output by 2000/01, the Fowah share can probably be best thought of as an approximation for all the output of traditional spinners based in Fowah, Sohag, Akhim and other points where traditional spinners are reportedly concentrated. Fowah has the largest concentration of such traditional spinners.

The share of yarn spun by the private sector increased rapidly in the 1990s, from 8% in 1992/93 to 40% in 1999/00 and 2000/01. This percentage increase was driven both by increased private sector yarn output, nearly a four-fold expansion from an estimated 25,212 mt in 1992/93 to a peak of 92,978 mt in 1999/00, and by declining public sector output, which fell 57.6% from 266,946 mt of yarn in 1992/93 to a low of 113,065 mt in 1999/00. During the same period, the output of the two joint investment companies declined 28.3% from 32,211 mt of yarn in 1992/93 to 23,108 mt by 2000/01. The percentage share of the joint investment companies remained very close to 10 percent over the entire period, however.

The largest component of non-traditional private sector output is represented by the five privatized spinning companies. The GOE privatized two large public spinning companies, Unirab and Alexandria Spinning and Weaving, through stock market flotations by the beginning of 1998/99. The GOE then leased out one major unit of another company (DIP Egypt lease of an ESCO plant) and several spinning units of another (Minya al Kamh) in 1998/99. Finally, an open-end spinning unit of Cairo Dyeing and Finishing was also leased. During the 1990s, the private sector invested in more than a dozen new medium-scale operations, and the smaller traditional spinners also continued to increase in number and size. The complex set of policies affecting the decision to invest in spinning seemed to be more conducive by the end of the 1990s than at the beginning. In addition, spinners have been able to find productive niches, either by spinning the cotton waste of the Egyptian spinning and weaving industry, or by producing high-quality, higher-count yarns from Egyptian ELS and LS lint for specific foreign clients.

The steady reduction in the spinning output of the public sector is partly the result of the exit of a number of the public companies through privatization and leasing, as well as several liquidations. But it is also largely the result of financial problems facing many public spinners, who were forced to operate at lower

²⁰ In 2000/01, efforts were made to “privatize” Misr Amriya by Bank Misr. The fact that privatization discussions were held with foreign investors belies the fiction that Misr Amriya operates as a private sector entity.

rates of capacity utilization and to decrease output.²¹ The total production of yarn decreased less steeply (30.8%) from 319,641 mt in 1994/95 to 229,101 mt in 2000/01, as private output increased from 25,212 mt in 1992/93 to nearly 93,000 mt in 1999/00. In 2000/01, domestic utilization of Egyptian cotton lint fell further and private sector yarn output dropped slightly to 91,914 mt. That year was characterized by a very short cotton crop and high prices for Egyptian lint relative to other growths produced in Greece, Syria, Sudan, and elsewhere. While imports increased to their highest level since 1994/95 (an estimated 575,000 lk, or 28,750 mt), moderately expanded imports in 2000/01 were not enough to offset the decline in use of Egyptian lint (2.708 mlk, or 135,400 mt).

²¹ Note that the decline in yarn output of public spinning companies mirrors the decrease in domestic consumption of Egyptian cotton lint from 1991/92 (266,137 mt) to 1999/00 (144,100 mt).

Table 3c-1: Private Sector Share of Volume of Cotton⁽¹⁾ Spinning, 1991/92 - 2000/01

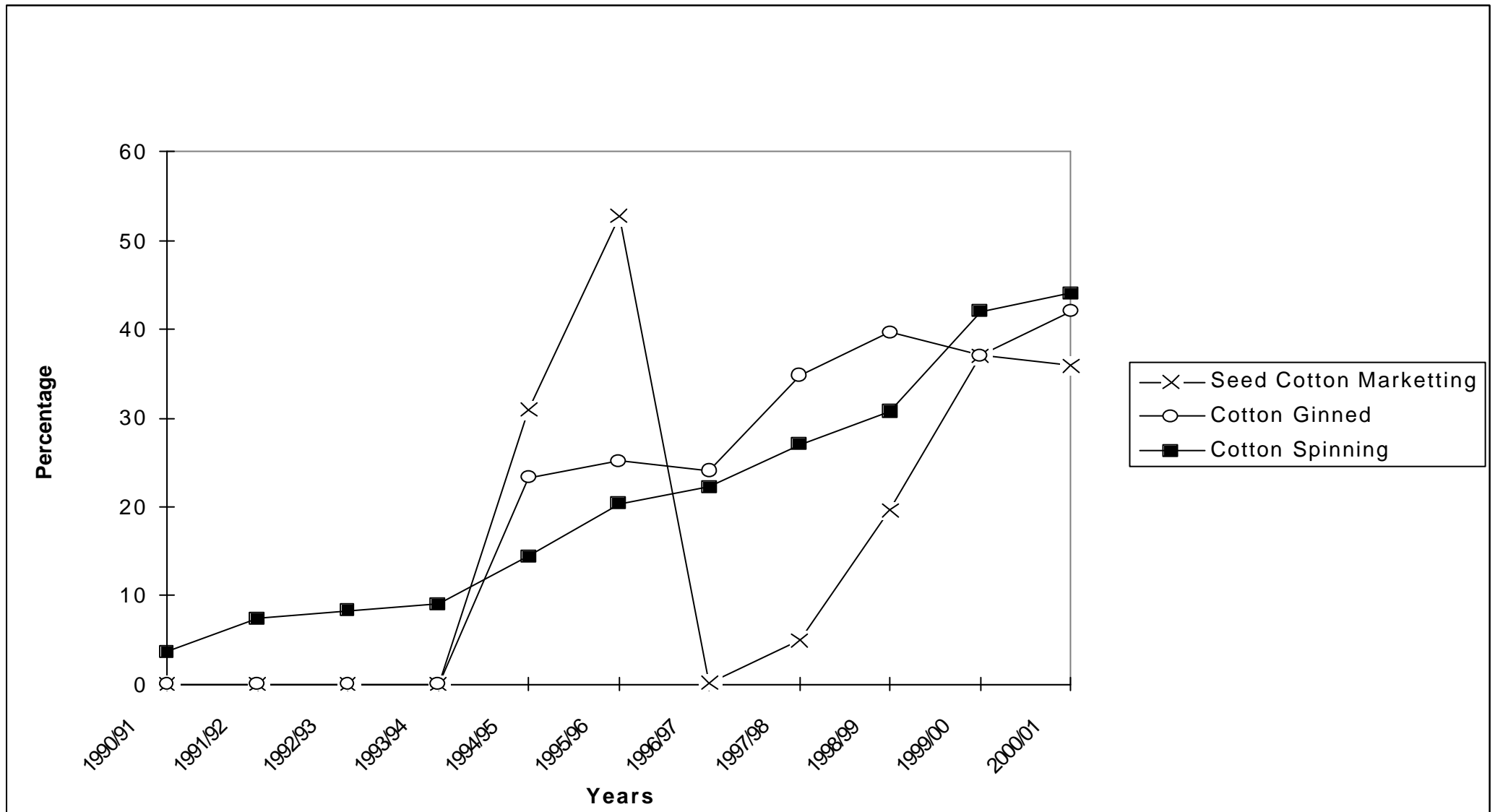
Fiscal Year	Public Sector		Joint Investment Companies		Private Sector						Total Yarn (tons)
	Quantity (tons)	Share (%)	Quantity (tons)	Share (%)	No. of Factories (Fowah) ⁽²⁾	Production per Factory (Fowah) ⁽³⁾	Total Production (Fowah)	Total Production (Modern Private)	Total Private Sector Output (tons)	Share (%)	
1992/93	266,946	82.3	32,211	9.9	70	121	8,439	16,742	25,212	7.8	324,369
1993/94	242,588	80.4	31,655	10.5	80	138	11,027	16,630	27,670	9.2	301,913
1994/95	242,182	75.8	31,655	9.9	90	175	15,740	30,054	45,804	14.3	319,641
1995/96	201,670	68.1	30,687	10.4	95	172	16,348	47,281	63,621	21.5	295,978
1996/97	177,472	64.6	29,050	10.6	110	163	17,917	50,426	68,356	24.9	274,878
1997/98	170,977	62.7	27,068	9.9	120	164	19,666	54,904	74,584	27.4	272,629
1998/99	134,654	53.7	26,228	10.5	134	234	31,340	58,611	89,967	35.9	250,849
1999/00	113,065	49.0	24,889	10.8	160	233	37,281	55,698	92,978	40.3	230,932
2000/01	114,079	49.8	23,108	10.1	176	233	41,008	50,906	91,914	40.1	229,101

Sources: Public sector, 1991/92-1999/00: CAPMAS, “*Darasat a'n al sana'at al tahwileya: Sana'it ghazl al qotn wa al fibran* (Studies of Manufacturing: The Cotton and Other Fibers Spinning Industry)”; 2000/01: SWRMC-HC, unpublished data.

Private sector: MVE cotton spinner surveys, 1999, 2000 and 2001.

- Notes:
- 1) Includes cotton and cotton/synthetic blends of yarn.
 - 2) Estimated by Fowah informants. The number of Fowah companies surveyed in 1999, that were operating in 1990/91 was 3, 4 in 1991/92, 5 in 1992/93, 5 in 1993/94, 9 in 1994/95, 10 in 1995/96, 12 in 1996/97, 12 in 1997/98, and 12 in 1998/99. The number of Fowah spinners in 1997/98 through 2000/01 was obtained from the local spinning industry organization.
 - 3) Production per factory is estimated from 1998/99 survey data for particular scales of Fowah spinners (from sample data) and blown up for the entire population.
 - 4) The estimate of total production for Fowah may seem high, but as an estimate of total small-scale production of coarse yarns in Egypt, it may be low. There are numerous other traditional spinners in towns or districts other than Fowah.
 - 5) Note that MVE estimates of private sector output for 1999/00 and 2000/01 are for the calendar years 2000 and 2001 respectively. These do not correspond exactly to the production period for the public sector companies, whose figures are for the GOE fiscal year (1 July of one year to 30 June of the next year).
 - 6) For the first time, this table includes data for joint investment companies. Hence, the private sector share is lower than in previous monitoring reports. Note that in 1995/96 and 1996/97 the joint investment company data may include some yarn output from private sector spinners.
 - 7) The public sector output time-series has been revised from the previous *Monitoring Report*, where the quantities listed were CAPMAS estimates of capacity, not actual production. MVE was unable to obtain estimates of actual yarn output for 1991/92, so the revised series begins in 1992/93. The fact that the public spinners' output figure of 266,946 mt for 1992/93 is the same figure as the figure reported for 1991/92 in the previous *Monitoring Report* is unclear. MVE was unable to obtain a public spinners' production estimate for 1991/92, so what was reported for 1991/92 in the earlier report appears to be erroneous.

Figure 3-2: Private Sector Shares in Seed Cotton Marketing, Ginning and Spinning, 1990/91-2001/02



4. PRIVATE SECTOR SHARE OF VOLUME OF WHEAT MILLING

Definition of Progress Indicator

This indicator is defined as the share of wheat that is ground in mills owned by the private sector. The intention of the indicator is to capture the effects of new private investment in mills. Thus the focus should be on milling by large, commercial mills. There are also a large number of small local mills that have existed for a very long time.

Relationship of Progress Indicator to Reforms under APRP

Reforms under APCP and under APRP tranche I attempted to liberalize the 72% wheat flour market for entry by the private sector. The private sector is not yet allowed to purchase Egyptian wheat for milling into 72% flour, but it may import wheat for this purpose. Milling was opened to the private sector in September, 1993 and it was officially confirmed in May, 1997 that the (commercial-scale) private sector could purchase only imported wheat.²² Wheat is also milled to 82% extraction in the subsidized market, where some of the milling is done by the private sector on contract to the public sector. This indicator captures the effects of policy reforms promotingS and of any obstacles constrainingS the opening of wheat milling to the private sector. Expansion of private wheat milling is likely to continue. A significant potential problem exists for these new modern mills, however, if there is no privatization of the older public mills: the latter have unfair cost advantages.

Sources of Information

MSHT

Calculation of Progress Indicator

The indicator is calculated based on only the amount milled in large, commercial mills, as data on milling by small village mills are not available. For additional detail, the share of 72% and 82% flour is also calculated.

Results and Analysis

Table 4-1 shows the amounts of wheat milled on a commercial scale by the public and private sectors. That is, milling by small village mills is not included here. Once the GOE allowed the private sector to mill wheat, investors began building mills and importing wheat (after 1995). The share of wheat milled increased from about 10 percent at the beginning of the decade to over 25 percent in 2000. According to Tyner et al. (1999), the capacity of private *fino* (72%) mills operating at the end of 1997 was 2,510 mt/day. By the end of 1998, the capacity increased by 1,970 mt/day and by 2001 it reached a total of 9,990 tons/day.²³

²²Verification Report, Agricultural Policy Reform Program, Tranche I: Policy Benchmarks for Accomplishment by June 30, 1997. July, 1997.

²³Poulin and Abdel-Latif, 2002, annex table 8.

The amount of wheat milled by the private sector increased steadily from 1995 to 1999, reaching 2,686 thousand tons in 1999, and declining slightly in 2000. There was an apparently significant increase in the amount milled by the private sector in 2001, due to a significant increase in the amount of 82-percent flour produced and a smaller increase in 72-percent flour produced. The MVE Unit was not able to confirm with senior officials of MSHT the increase in 82-percent flour production by the private sector nor whether this was a change in policy, so this apparent new trend should be treated with caution. The increase in private volume of production through 2000 was virtually all due to the increase in production of *fino* flour (72% extraction rate), which was zero in 1995 and more than doubled from 1997 to 1999, topping 2.0 million mt in 1999. Private *fino* flour production reached three-quarters of all private commercial flour production by 1999. The increase in *fino* production by the private sector was accompanied by an uneven decline in production of *fino* by the public sector, whose production in 1996-99 was on average about half of what it was in 1990-92. Note, however, that public sector milling of 72% flour expanded to 1.126 million tons in 2000 (and perhaps 1.436 million tons in 2001) after having dropped to 893,000 tons in 1999. Overall, milling of *fino* flour topped 3.0 million tons for the first time in 2000, more than tripling since 1995, when 986,000 tons of 72% flour was produced. Demand for *fino* has expanded steadily, partly a function of increased population, but also due to a positive income elasticity of demand for this higher-grade flour used to produce higher-quality bread and baked goods.

Small village mills may grind about 4 million tons of wheat per year. If this wheat were added to that milled by the commercial-scale private sector, the overall share of the private sector would rise to more than 48.8% in 1999 and decline slightly to 47.4% in 2000 (it would be an estimated 40.1% in 1995).²⁴

Unpublished data provided by MSHT show that in 2001 there was a substantial increase in the 82% flour produced by the private sector, which combined with a more modest increase in the amount of 72% flour produced by the private sector, led to a jump in its overall share from 26% in 2000 to 33% in 2001. The MVE Unit was unable to verify with the office of the Minister the validity of these data or whether they reflect any change in policy.

²⁴ These calculations of the adjusted private sector share in wheat milling assume that milling by small village mills equals 4.0 mmt in each year from 1995 to 2000. Actual flour output by small mills was probably somewhat lower than this in the mid-1990s (perhaps closer to 3.5 mmt) and may have been slightly higher in 2000 (over 4.0 mmt).

Table 4-1: Wheat Milled by the Public Sector and by Commercial-Scale Private Mills*, 1990-2001

(‘000 tons)

Calendar Year	Private Sector*			Public Sector			Grand Total			Private Sector's Share (%)		
	82% Flour	72% Flour	Total	82% Flour	72% Flour	Total	82% Flour	72% Flour	Total	82% Flour	72% Flour	Total
1990	619	0	619	2,747	2,296	5,043	3,366	2,296	5,662	18	0	11
1991	593	0	593	2,841	2,233	5,074	3,434	2,233	5,667	17	0	10
1992	598	0	598	2,681	2,432	5,113	3,030	2,432	5,711	20	0	10
1993	635	0	635	4,250	788	5,038	4,885	788	5,673	13	0	11
1994	666	0	666	4,559	814	5,373	5,225	814	6,039	13	0	11
1995	645	0	645	5,962	986	6,948	6,607	986	7,593	10	0	8
1996	662	369	1,031	5,177	1,077	6,254	5,839	1,446	7,285	11	26	14
1997	690	863	1,553	5,283	1,143	6,426	5,973	2,006	7,979	12	43	19
1998	698	1,337	2,035	5,511	1,274	6,785	6,209	2,611	8,820	11	51	23
1999	680	2,006	2,686	6,124	893	7,017	6,804	2,899	9,703	10	69	28
2000	653	1,931	2,584	6,185	1,126	7,311	6,838	3,057	9,895	10	63	26
2001	1,128	2,277	3,405	5,552	1,436	6,988	6,680	3,713	10,393	17	61	33

Source: MSHT, unpublished data.

Note: * Small village mills may currently grind about 4 million tons of wheat per year, but reliable annual estimates of these amounts are not available.

5. PRIVATE SHARE OF EMPLOYMENT IN COTTON GINNING & SPINNING

Definition of Progress Indicator

This indicator is defined as the number of workers in private ginning or spinning divided by the total number of workers in that industry.

5a. Private Share of Employment in Cotton Ginning

Relationship of Progress Indicator to Reforms under APRP

See indicator 3. The effects of privatization and liberalization will appear in both output and employment.

Sources of Information

CAPMAS

Private and public ginning companies

Calculation of Progress Indicator

See definition.

Results and Analysis

Cotton ginning was a private industry until the 1960s, when it was nationalized. The investors in the ginning industry were mainly the large cotton traders and exporters, whose gins were integrated with other activities such as trade in seed cotton and export of cotton lint.

As a part of its reform policies, and through liberalization and privatization policies affecting the cotton trade and ginning, export, spinning, weaving and ready-made garment industries, the Government of Egypt began to privatize some of the ginning companies starting in 1996/97. Arab Ginning was privatized in 1996/97, and Nile Ginning, in 1997/98. There are three large public companies that have not yet been privatized—Delta, Misr, and Wadi. The Ministry of Public Enterprise attempted to privatize these public ginning companies in 1998/99 and 1999/2000 without success. In addition to this, there are some other ginning companies that started operating as private companies as a result of the new environment of reform and liberalization. These companies are Nefertiti, Baraka, and Nassco, which has a special agreement with Delta to gin all of its seed cotton. Nassco has provided cotton bale presses and new cleaning equipment at three Delta gins. Note that the Baraka Gin was owned by the Egypt Cotton Company until 1998/99, at which point it was sold to Arab Ginning.²⁵

²⁵The Baraka Gin has not been used in recent years to do ginning of Egyptian seed cotton. This gin was set up by the Egypt Cotton Company, using imported American rotary knife ginning technology, which was judged inappropriate for Egyptian extra-long and long staple cottons. The Baraka Gin is now used for export staging, including cleaning lint cotton, performing *farfarra* if desired by the client, and UD bale pressing. Bales pressed at this gin can be exported directly. While the Baraka Gin is owned by the Modern Nile Group, it is a distinct entity (not affiliated with Arab Ginning Company).

From 1989/90 to 1999/00 total employment in public ginning companies declined from 8,739 to 4,205 workers, with the largest drops in 1996/97, when Arab was privatized, and in 1997/98, when Nile Ginning was privatized. This overall decreased employment was due to two factors. The major factor responsible for declining employment in public sector ginning companies was the privatization of Nile and Arab Ginning Companies, leading to a decrease of 3,412 workers over a two-year period (1996/97 and 1997/98). Second, employment at two of the three public ginning companies, Delta and Misr, declined significantly, largely through attrition and the closure of several old gins. Employment at Delta dropped from a high of 2,096 workers in 1991/92 to 1,142 workers in 2000/01, a decline of 45.5%, but it increased to 1,420 workers in 2001/02 because 700 workers were hired on contract to provide enough labor to gin the much larger 2001 crop (than the prior two small crops in 1999 and 2000). Misr Ginning's labor force decreased from 1,710 in 1989/90 to 1,217 in 2000/01, a 28.8% decline. In contrast, El Wadi Ginning Company's labor force declined relatively little, dropping only 13.8% from 1,557 employees in 1992/93 to 1,300 in 2001/02.

Note that there was also a decline in the numbers of workers at the two privatized companies. Employment at these two privately owned gins actually declined from 3,123 workers in 1997/98 to 1,908 workers by 2001/02, due to selective gin closures, attrition, and an early retirement program at Arab Ginning. Overall private sector employment in the ginning industry increased from zero in 1994/95 to 3,390 workers in 1998/99 before dropping steadily to 2,175 in 2001/02. Much of the increase in private sector employment was due largely to Arab Ginning's aggressive early retirement program. By 2001/02, private sector employment had contracted from a high of 44.4% of total ginning industry employment to 34.6% by 2001/02. The decline also reflects the general underlying trend of contraction across the ginning industry (in both private and public companies), which is a response to far smaller cotton crops in recent years relative to the 1980s and early 1990s. The overall decline in employment in ginning is therefore not a bad thing, as the industry suffered from gross overcapacity in the mid-1990s. The excess labor needed (and still needs) to be shed from the ginning companies and redeployed in other enterprises, as resources are more efficiently allocated in the agribusiness system.

The net result of all the above changes was decreased overall employment in the ginning industry from a high of 8,799 workers in 1991/92 to 6,144 in 1999/2000 and 6,269 workers in 2001/02, a 34.7% decline. Over the same period, the private share of employment increased from zero in 1994/95 to 24.0% in 1996/97 and to 44.4% in 1998/99, before decreasing to 38.8% in 2000/01 and 34.6% in 2001/02. The public sector share was 100% through 1994/95 and declined to a low of 55.6% in 1998/99 before rising to 65.4% in 2001/2002. Private and public shares are not quite proportional to their respective ginning capacities, as there are proportionally more employees in the public sector.

In 1999/2000 and then again in 2000/01, employment declined at all of the five original (public and former public) ginning companies, probably in response to overcapacity in the industry existing after a twenty-year secular decline in area planted and production of seed cotton, as well as the unusually small crops of 1999/00 and 2000/01. With a much larger 2001 crop, ginning employment, particularly contract or casual labor, increased in the two of the three public sector ginning companies in 2001/02. The likely trend for the future is for permanent employment in both public and private ginning companies to shrink, mainly through attrition but also through occasional early retirements. To offset the decline in permanent workers, ginning companies, both public and private, will hire more casual laborers. The

exact number hired will also be a function of the size of the seed cotton crop. The net effect will be that ginning employment at each company, as represented by permanent plus casual labor, will remain roughly the same over the next few years. Without further privatization of public sector ginning companies (or unexpected closures of more gins), private sector employment in ginning will likely represent 30-40% of total employment in ginning. Private employment in ginning will generally be slightly less than the private share in ginning output, as more downsizing of the permanent labor force has taken place at private ginning companies (particularly at Arab Ginning).

Table 5a-1: Employment in Public and Private Cotton Ginning Companies, 1989/90 - 2000/01

Fiscal Year	Public Companies			Privatized Companies				Private Companies		Total Employees			Shares (Percent)	
	Delta	Misr	Wadi	Nile		Arab		Egypt Baraka	Nefertiti					
				Public	Private	Public	Private			Public	Private	Total	Public	Private
1989/90	2,073	1,710	1,508	1,633	0	1,815	0	0	0	8,739	0	8,739	100.0	0.0
1990/91	2,087	1,667	1,520	1,620	0	1,830	0	0	0	8,724	0	8,724	100.0	0.0
1991/92	2,096	1,630	1,535	1,665	0	1,873	0	0	0	8,799	0	8,799	100.0	0.0
1992/93	1,980	1,554	1,557	1,671	0	1,820	0	0	0	8,582	0	8,582	100.0	0.0
1993/94	1,946	1,529	1,494	1,652	0	1,835	0	0	0	8,456	0	8,456	100.0	0.0
1994/95	1,735	1,512	1,466	1,629	0	1,805	0	0	0	8,147	0	8,147	100.0	0.0
1995/96	1,290	1,578	1,540	1,628	0	1,779	0	210	0	7,815	210	8,025	97.4	2.6
1996/97	1,242	1,586	1,521	1,633	0	0	1,712	180	0	5,982	1,892	7,874	76.0	24.0
1997/98	1,487	1,640	1,518	0	1,548	0	1,575	240	0	4,645	3,363	8,008	58.0	42.0
1998/99	1,390	1,375	1,480	0	1,490	0	1,510	240	150	4,245	3,390	7,635	55.6	44.4
1999/00	1,183	1,335	1,480	0	1,403	0	1,217	240	150	3,998	3,010	7,008	57.0	43.0
2000/01	1,142	1,217	1,400	0	1,020	0	1,100	240	25	3,759	2,385	6,144	61.2	38.8
2001/02	1,420	1,378	1,300	0	986	0	920	240	25	4,098	2,171	6,269	65.4	34.6

Sources: Unpublished data from individual public and private cotton ginning companies.

Notes: 1) In 1998/99, Nassco hired 134 workers on contract to work on baling machines that Nassco installed at Delta Ginning Co. gins. These workers are included in the Delta employment figure for 1998/99. Delta had 1,256 employees that year. Nassco's arrangement with Delta continued for the following three years, though MVE does not know exactly how many workers were hired and paid by Nassco.

2) The Baraka gin was sold to the Modern Nile Group in 1998 but was operated as a separate export staging entity in 1998/99 and 1999/2000. This gin did not do ginning, but it employed 254 workers in 1998/99 and 49 workers (excluding labor on short-term contracts) in 1999/2000 in cleaning, *farfarra*, and bale pressing.

3) Nefertiti leased gins from 1994/95 - 1998/99, but no employment is included in the Nefertiti column from those leased gins, because the employees remained employees of the lessor, Nile Ginning. The 150 employees of Nefertiti in 1998/99 and 1999/2000 worked at the new Nefertiti gin in Minya.

4) Data for 2001/02 were for early 2002, not the end of the fiscal year. In all other years, employment figures represent numbers of workers at the end of the FY.

5) Note that some employment figures for 1998/99 and 1999/00 have been adjusted and are slightly different from those published in *Monitoring Report No.3*.

5b. Private Sector Share of Employment of Cotton Spinning

Relationship of Progress Indicator to Reforms under APRP

See indicator 5. The effects of privatization and liberalization will appear in both output and employment.

Sources of Information

HC-SWRMC

Egyptian Textile Manufacturers' Federation

CIT-HC (reconstituted as the Holding Company for International Trade in June 2000; all of its ginning, trading, spinning and other textile companies were transferred to the HC-SWRMC)

Private spinning companies

Calculation of Progress Indicator

See definition.

Results and Analysis

The spinning industry is one of the most important employers in Egypt. It operated as a private industry until the early 1960s, when it was nationalized. With the implementation of the Economic Reform and the Structural Adjustment Program (ERSAP), the Government allowed the private sector to re-enter this industry. It also undertook a privatization program that includes the textile industry. Specifically, in 1997/98, two textile companies began their first full year of operation as private companies, having been privatized during the previous months. They are KABO (a knitter) and Unirab (a spinning and weaving company). The following year Alexandria Spinning and Weaving, which does spinning only, joined them. In 1998/99 one unit of Esco leased by Dong-Il began private operation. Near the end of that fiscal year, two other private leaseholds followed: three plants at Minya El Kamh (part of Sharkeya Spinning and Weaving Company) and an open-end spinning unit at Cairo Dyeing and Finishing Company called El Alameya.

The private and public sectors now compete in domestic and international markets. The spinning industry currently faces tough competition, especially because of the lower prices of international producers compared to the local private and public ones. The private sector has the advantages of lower costs of production, some use of advanced technology²⁶, flexibility in setting prices, and more efficient operations compared to the public sector. Flexibility in managing the labor force includes the ability to retrain workers for new tasks, thus preserving the level of employment while making the overall operation more efficient.

Due to the reform policies, the new environment, and the liberalization and privatization efforts, private investment in spinning is growing, and the shares of the private sector in the production of yarn and

²⁶Use of advanced technology by the private sector needs to be qualified. The new ring spinning operation at Sadat City, Alcan Man'ai, is a ring spinning unit producing high-count yarn for export. Privatization has led to some investment in new machinery, particularly at DIP Egypt (Dong Il) but more often selective investments are made to upgrade old or deficient equipment. Most of the larger private spinning companies established by private investors use open-end spinning technology, which is a high-speed and highly productive technology designed to spin low-count yarn largely for domestic weavers and knitters. Five of 13 private open-end spinners actually spin waste from other companies' ginning, spinning and weaving operations, as open-end spinning can be done using short fibers (10-15 mm). Egyptian ELS and LS lint is very expensive raw material for open-end spinners, nine of whom use Gizas 80/83.

employment are growing, too. It can be seen from Table 5-2 that the number of employees has been decreasing in the public sector, while it is increasing in the private sector. The number in the public sector was 206,653 in 1992/93, which declined to 136,500 in 1999/00 and to 124,524 by December 2001. Also the percentage of the public sector was 99.2% of the total employees in 1992/93, declining to 86.6% in 1999/00, and then to 85.6% in 2001/02. The reduction in the number of employees in the public sector can be related to the normal retirement and early retirement programs of the public companies. Many (normally) retiring workers have not been replaced during the past ten years.

While privatization is a rather recent phenomenon, investment in private spinning facilities has been going on for several years. Data from the MVE spinning survey show that significant investments in new facilities²⁷ as measured by the number of companies²⁸ have occurred since 1997, with the greatest investment in 1998 and 1999 (see Holtzman and Mostafa et al., 2000).

The 1999 MVE survey²⁷ covered traditional and modern spinners. The traditional sector is represented by a large number of companies in the area of Fowah in the northern Delta. These companies have been in existence for a long time, sell mostly to the local market, use the same technology, and often replicate themselves in the same area in the form of new plants with almost exactly the same features. These spinners use waste from cotton ginning, spinning and weaving as their input.

Modern spinners, on the other hand, typically make new, individual investments in metropolitan areas or new communities like 6th of October, use newer technology, and often produce for the export market. Most of these spinners are not using waste products as input but rather use cotton lint, typically Gizas 80/83, the cheapest Egyptian lint. A couple of ring yarn spinners produce high-count yarns, whereas none of those in Fowah do so.

The privatization of two of the three spinning companies by 1998/99 transferred more than 11,000 employees from the public to the private sector. New investment in the private sector, in addition to privatization, brought the total employment in private spinning to more than 20,000 by 1999/2000. Thus the measured private sector share of employment reached 10%, compared to less than 1% in 1992/93, the earliest year for which data are available for the public companies.²⁸ MVE does not consider the two joint investment companies, Miratex and Misr Amriya, to be private sector companies, as their ownership is entirely public sector. MVE's estimates of private sector yarn output should be considered to be on the low side, as some small traditional spinners are not included.²⁹ According to MVE's 1999 survey,

²⁷MVE conducted a survey in May and December 1999 of 35 spinners of cotton or cotton blends. Of these, 12 are traditional spinners in Fowah. MVE does not consider Misr Amriya and Miratex private. The rest included five privatized companies, five private ring spinners (of which three are twistors only), and 13 open-end spinners. Two of the privatized spinners have been privatized through ownership transfer to private investors (Alexandria S & W and Unirab). Three privatized spinners are leaseholds (DIP-Egypt, Minya Al Kamh and Al Alameya). Of the open-end spinners, eight used entirely cotton lint while four used waste. One used both as inputs.

²⁸1992/93 was the year in which the nationalized companies were transferred to holding companies that were to manage them in a commercial manner and prepare them for privatization.

²⁹ Note that there are traditional, low-capacity spinning units found in areas other than Fowah, Kafr El Sheikh, including Sohag, Assiut, Mehalla, Rashid and Akmim. MVE has not enumerated these units nor interviewed their managers.

there were at least five privately initiated modern spinning companies operating in 1990/91, and by 1998/99 there were at least 20 privately initiated or privatized modern spinners operating.³⁰

The bulk of private sector employment in spinning (an estimated 13,203 workers, or 62% of the private labor force) in 1999/00 was in the privatized companies, which are larger units with greater assets and output (and hence need for workers). Estimated employment in the traditional spinning companies in Fowah comprised another 32% of private sector workers (an estimated 6,770). The remainder (1,227 or 6%) was found in new start-ups, who could hire the minimum numbers of workers necessary to run their mills, rather than inheriting large labor forces, as was the case with several of the privatized spinning companies. Note, however, that the privatized spinners generally wish to reduce their labor force or to reallocate redundant workers to jobs where they can be more productive. Formal early retirement programs and attrition (cases where normally retiring workers are not replaced) have contributed to downsizing of the labor force in public sector spinning.

Private sector employment increased slightly from 1999/00 to 2000/01, with all the expansion coming in traditional spinning enterprises. At the same time, the private sector share increased 1.0 percentage points to 14.4%, as the total number of public sector employees in textile companies continued to decline from 136,500 employees in 1999/00 to 124,524 employees in by early 2002. Note that the SWRMC-HC figures on employment in the textile industry overstate spinning employment, as they include all the affiliated companies in the Holding Company that produce textiles, whether with cotton, synthetics or other materials (wool, rayon). In addition, HC figures do not differentiate between employment allocated to the spinning enterprise and to other enterprises (weaving, RMG production, dyeing and finishing) in affiliated textile companies that produce cotton yarn and other products. Real employment in spinning is actually likely to be quite a bit lower.

³⁰ The number of private spinners of cotton or blended yarn varies from year to year as a function of Egyptian lint cotton prices and availability relative to competing synthetics, such as polyester fibre and filament. In 2000/01, four private open-end spinners who reported spinning at least some cotton in 1998/99 did not spin cotton (Rosetex, Daymex, Shatex, and Fagr El Islam S&W).

Table 5b-1: Private Sector Share of Employment of Cotton Spinning, 1992/93 to 2000/01

Year	Public Sector ¹		Private Sector ²					Total
	No. of Employees	Percent	Privatized	New	Traditional	Total	Percent	
1992/93	206,653	99.2	—	342	1,400	1,742	0.8	208,395
1993/94	203,329	98.9	—	435	1,840	2,275	1.1	205,604
1994/95	192,465	98.6	—	470	2,250	2,720	1.4	195,185
1995/96	183,796	98.3	—	473	2,625	3,098	1.7	186,894
1996/97	178,949	98.0	—	526	3,162	3,688	2.0	182,637
1997/98	172,690	93.5	7,550	725	3,740	12,015	6.5	184,705
1998/99	162,453	89.9	11,623	980	5,673	18,276	10.1	180,729
1999/00	136,500	86.6	13,203	1,227	6,770	21,200	13.4	157,700
2000/01	129,395	85.6	13,117	1,204	7,445	21,766	14.4	151,161

Sources: Public sector: CIT-HC, TMT-HC, HC-SWRMC, annual “Monitoring” reports, different issues.

Private sector: MVE Cotton Spinner Surveys, 1999, 2000 and 2001/02.

Notes: 1) 1992/93 is the first year for which data are available from the public sector companies.

2) The figures are for the end of each fiscal year (June).

3) The number of employees in the public sector include employees in all of the companies in those holding companies, which include firms that do not spin cotton. Note also that it is not possible to separate out labor that is specific to spinning enterprises from labor working across a series of enterprises in a combined spinning, weaving, and knitting or RMG firm.

4) The decline in the number of employees in “new” private sector firms after 1999/00 is due to a decrease in the numbers of open-end spinners who actually spun cotton or synthetic/cotton blended yarns.

6. IRRIGATED AREA UNDER WATER USER ASSOCIATIONS

Definition of Progress Indicator

This indicator is defined as the irrigated area under private water user associations (WUAs). A WUA is a voluntary association established by farmers to serve their needs in irrigating their land. WUAs are responsible for a number of activities, including participating in the *mesqa* improvement process (selecting the type of *mesqa*, locating the new *mesqa*, locating *mesqa* turnouts), operating and maintaining the single point lift pump, scheduling turns among water users, resolving disputes, and *mesqa* maintenance.

Relationship of Progress Indicator to Reforms under APRP

Formation of WUAs began under the IIP. Both APRP and other projects in which MWRI has enlisted foreign cooperation are attempting to spread the benefits of WUAs as broadly as possible. Water user associations may now be formed at the *mesqa* level. A ministerial decree allowed for the formation of some WUAs at the branch canal level, and in the future this may be possible in all of Egypt. This indicator will capture the spread of the WUA concept and its operationalization.

Sources of Information

Eng. Essam Barakat, MWRI

Calculation of Progress Indicator

The definition is straightforward. One distinction that emerged during the collection of data is that the total area covered by WUAs may be different from the area under WUAs that is actually improved and operated by the WUAs. These two sets of data are shown in Tables 6-1 and 6-2.

Results and Analysis

Table 6-1 shows that the number of WUAs more than tripled from 1990 to 1997 and then doubled again by 2000. By 2001, there were 4,200 WUAs covering about 296,000 feddans (for an average of 70.5 feddans per WUA). The largest proportional increase (84%) in WUAs occurred between 1990 and 1991, while the largest absolute increase in WUA numbers (1,094) took place between 1999 and 2000. The area served by these water user associations increased more than nine times from 31,244 feddans in 1990 to 296,020 feddans in 2001, with a 50% increase taking place from 1999 (164,246 feddans) to 2000 (246,081 feddans). The average area served by a WUA expanded from 55.0 feddans in 1990 to 71.5 feddans in 2001, suggesting that the more recently established WUAs were formed in new irrigated lands.

In terms of *mesqas* actually in operation, Table 6-2 shows the area increased from a token amount to nearly 112,020 feddans in 2001. This was related to the increase in the number of *mesqas* operating, which increased from 14 at the end of 1991 to 1,924 by the end of 2001.

One may expect that if WUAs are formed on branch canals, the total area covered by WUAs will increase rapidly again. Similarly, if the MWRI promotes water boards, this may also increase the coverage of WUAs.³¹

³¹ The Desert Development Center is evaluating the progress made by WUAs in collaboration with IDRC.

Table 6-1: Number of WUAs Established and the Area They Serve, 1990 to 2001

Year	Number of WUAs	Area (feddans)	Mean Area (fd.) per WUA
1990	568	31,244	55.0
1991	1,043	58,285	56.2
1992	1,121	68,882	61.4
1993	1,228	78,684	64.1
1994	1,339	86,395	64.5
1995	1,485	90,517	61.0
1996	1,609	97,297	60.5
1997	1,816	111,147	61.2
1998	2,095	134,695	64.3
1999	2,508	164,246	65.5
2000	3,602	246,081	68.3
2001	4,200	296,070	70.5

Source: MWRI, Irrigation Improvement Project, unpublished data.

Note: The number of WUAs are reported for the end of the year.

Table 6-2: Number of *Mesqas* in Operation by WUAs and the Area They Served, 1991 to 2001

Year	Number of <i>Mesqas</i>	Area (feddans)
1991	14	492
1992	28	943
1993	152	7,089
1994	344	23,109
1995	543	32,067
1996	854	49,050
1997	981	58,364
1998	1,029	61,412
1999	1,128	68,089
2000	1,414	84,956
2001	1,924	112,020

Source: MWRI, Irrigation Improvement Project, unpublished data.

Note: The number of *mesqas* are reported for the end (December) of each year.

7. VOLUME OF PADDY RICE PRODUCTION PER UNIT OF WATER

Definition of Progress Indicator

This indicator is defined as the amount of rice produced divided by the amount of water used in rice production. Rice is measured as paddy. Water is measured as consumptive use, the scientific estimate of the amount of water used by a rice plant.

Relationship of Progress Indicator to Reforms under APRP

Rice is a major crop in Egypt because it is an exportable crop, a cash crop and an important food. In 1997 the area under rice was more than 1.5 million feddans, about 50% higher than in 1990. For these reasons the Government gives significant attention to this crop. In 2001 rice area was 1.4 million feddans.

Under APRP the GOE has undertaken a major program of water conservation in rice and sugarcane. This indicator will eventually reflect the benefits of part of that program. The GOE introduced short-season rice varieties several years ago (see Table B7-1) with yields the same or higher than the longer-season varieties, but the benefits of the shorter season had not been captured in the form of water savings. This is because there must be coordination among the farmers and the irrigation engineers to both grow the same or similar rice in large blocks of land and to shorten the irrigation season. Until recently the irrigation engineers were forced to release water as if all farmers were growing long-season rice. The new program promises major savings in water.

The GOE has also attempted to conserve water by restricting the acreage under rice. It has been very difficult for the Government to enforce such restrictions, and the area has increased rapidly in the 1990s. The effects of this policy do not create a problem in interpreting this indicator because the area effect enters the indicator in both the numerator and the denominator.

Sources of Information

MALR

MWRI

Calculation of Progress Indicator

For each variety of rice, the consumptive use of water per feddan is estimated based on its total days in the field and the number of days at the end of the season that irrigation is not required. Then the total consumptive use for that variety is estimated by multiplying by the area under cultivation. The total consumptive use for all rice is then estimated by summing the consumptive use over all varieties.

To estimate the indicator for all years except 2001, the total production of paddy is divided by the total consumptive use of water for the actual area under rice, assuming that all varieties were long-season. This is the assumption that the irrigation engineers needed to make before APRP and during most of APRP, so the indicator reflects the productivity of the water that reached the rice growing areas for rice cultivation. Some of this water was “wasted” when short-season rice varieties were grown, because at the end of the season some of the water was not needed.

For comparison the indicator is recalculated to show what would happen if the consumptive use were the amount based on the actual varieties cultivated (i.e., a mixture a short-season and long-season). In addition one can examine the results for any given year if all varieties are assumed to be short-season.

Results and Analysis

Table 7-2 shows that in 2001 the shortest season varieties (125 days) have increased to about 33.1 percent of the total by area. Medium-length varieties (135 and 145 days) covered another 54.9 percent of the rice area. Thus the average days to maturity for the 2001 mix of varieties was about 131.2 days. This is a significant decline compared to the all-variety average of 146 days in 1997 and the maximum 155 days-to-maturity for the standard, long-season varieties.

The productivity of water in the production of rice increased from 1990 to 1997 from 0.65 to 0.75 metric tons of paddy per thousand cubic meters of water, an increase in efficiency of about fifteen percent. It continued increasing from 1998 to 2001 to reach 0.77, 0.79, 0.81, and 0.83 metric tons of paddy per thousand cubic meters of water (Table 7-1). However, it may be somewhat misleading to measure the efficiency of water use in rice production by comparing the actual production with the presumed use of water (based on scientific estimates of water needs for the crop).

The increase in productivity may have been due to increases in water use efficiency at the *mesqa* level. These might have included a reduction in wastage of the released water reaching the *mesqa* during the period when there was a dramatic expansion in rice area. Farmers may have found more efficient schedules for planting and irrigation. However, one must mention that the short-season varieties also have higher yields than the longer-season varieties, so some of the increase in production per unit of water should be attributed to the increasing share of short-season varieties.

The amount of water savings that could have been realized if only short-season varieties (120-130 days) were grown is about 1.3 bcm, a very substantial amount of water. Of course this is the reason behind the push to implement the short-season rice program with coordinated irrigation and shortened irrigation season. This program began in 1998 with a pilot program that covered about 500 feddans. It expanded in 1999 to six governorates, covering about 10,000 feddans with short-season rice and an equal area with long-season rice for comparison.

For the year 2000, MWRI estimated that about 900,000 feddans were cultivated in short-season rice varieties, but the actual area reported by MALR was higher at 1.272 million feddans.³² Thus 2000 would be the first year for which a significant adjustment would have to be made in the calculation of the indicator. (The calculation assumes that all water is provided on a long-season basis and estimates the consumptive use of water by the rice crop using the number of irrigation days in the long season.) However, for 2000 there are no data available on the extent to which there was a shortening of irrigation schedules in areas where short-season rice is grown in blocks. The intention is that the provision of irrigation water is terminated at the end of August instead of at the end of September.

³² The MALR estimate for total area planted to paddy in summer 2000 was 1.569 million feddans, of which 1.272 million feddans (81.1% of the estimated total) were cultivated to short-season varieties. According to MALR estimates, short season varieties were cultivated on 70.0% of paddy area in 1999 and 52.6% in 1998.

In 2001, MWRI attempted to implement a complete shift to early termination of irrigation for rice, based on the short-season schedule³³. This may have achieved the large potential water savings mentioned above, although much of the water would be in demand for cultivation of other crops by many of the same farmers who are cultivating short-season rice. Again there are no precise data for the extent to which the shift in irrigation scheduling was accomplished, but at least some irrigation directorates (Kafir El Sheikh, Gharbeya) did revert to non-rice irrigation cycles at the end of August, and others (Sharqeya, Beheira) reverted in the middle of September. Since there were some delays in rice planting in 2001 and thus some delays in starting the irrigation cycling, it is not yet possible to estimate carefully the production per unit of water based on the actual changes in irrigation cycling. However, if one assumes that the consumptive use of water in 2001 was the amount needed by the actual area of short-season varieties grown, then the indicator would increase sharply to 0.98.

Table 7-1: Production of Paddy Rice per Unit of Water, 1990 to 2001

Year	Paddy Production (million tons)	Consumptive Use of Water (billion m³)	Production per Unit of Water (mt/1000m³)
1990	3.17	4.89	0.65
1991	3.45	5.18	0.66
1992	3.91	5.73	0.68
1993	4.16	6.04	0.69
1994	4.58	6.49	0.71
1995	4.79	6.60	0.73
1996	4.90	6.62	0.74
1997	5.48	7.31	0.75
1998	4.45	5.78	0.77
1999	5.75	7.25	0.79
2000	6.00	7.40	0.81
2001	5.23	6.32	0.83

Sources: Production: MALR, Agricultural Statistical Yearbook, different issues;
Water: MWRI, unpublished data. See Tables B7-1 through B7-4.

³³In 2001, MALR reported that 87.5% of summer paddy was planted to short-season varieties.

Table 7-2: Days of Maturity of Rice Varieties

Varieties	Days to Maturity	Share of Area (Percentage)	Weighted Average Days to Maturity
G 171	155	8.7	13.5
G 172	155	0.0	0.0
G 175	125	0.0	0.0
G 176	145	0.5	0.7
G 181	145	0.0	0.0
IR 28	125	0.0	0.0
G 173	155	1.4	2.1
G 178	135	18.3	24.7
G 177	125	20.9	26.1
Sakha101	135	36.2	48.8
Sakha 102	125	12.2	15.2
			131.2

Source: Tables B7-1 and B7-2.

8. AGRICULTURAL PRODUCTION PER UNIT OF WATER

Definition of Progress Indicator

This indicator is defined as the aggregate level of agricultural production divided by the amount of water. Aggregate production refers to crops, since water used directly for the production of livestock is not significant. Major crops and areas of the country are selected for inclusion in the indicator based on their importance and the availability of data. Water can be measured as the total water that might flow onto agricultural fields, or the net amount that is available, not counting reuse. Further details are given below, under “Calculation of Progress Indicator.” In both cases the water measured is that in the Nile System; it does not include groundwater in the New Valley and other sources of deep groundwater.

Relationship of Progress Indicator to Reforms under APRP

One of the overall goals of APRP is to increase productivity in the agricultural sector. Water is one of the most important inputs in the agricultural sector. Thus an indicator measuring the amount of production per unit of this scarce resource is particularly appropriate. The same indicator was one of USAID’s indicators for its Strategic Objective number 1.

Sources of Information

MALR

MWRI

Calculation of Progress Indicator

For aggregate production, crops that are included are those that are cultivated on the Old Lands, thus excluding cultivated area in some governorates (Alexandria, Ismailia, Port Said, Suez and Luxor). These crops do not include fruits, nor is livestock production included. Potatoes and tomatoes are the only two vegetables crops that are included; these two crops occupied 43.2% of the total cropped area under vegetables in 1998. Crops omitted were omitted either because their contribution to production was insignificant or because of a lack of reliable data.

A weakness of the indicator as calculated is that it does not include tree crops. These were omitted for lack of reliable and comprehensive data. Output and income of horticultural products is likely to have been growing rapidly in Egypt. The data also omit all production and income on the New Lands, another area where productivity and income are likely to have been growing. These data were also not available. Omitting all of these data creates a bias in the indicator, probably downward.

Aggregate production is estimated by combining the physical quantities of production through the use of price weights. These weights are the average farmgate prices of the crops during the period 1994-96.

Water productivity is examined in two ways: first, as water excluding the reuse of the water and the groundwater; second, as all water that goes to the agricultural sector. Water flowing to the agricultural sector is used to irrigate fields and then recharges the shallow groundwater in the same area. It can be and is pumped from the groundwater to supplement surface water supplies. There is some reuse of water also by pumping water out of agricultural drains (which are basically canals at lower levels than the canals that supply the water to begin with). The two measures give alternate ways to view the water supply: gross water going to the sector and net water supplied.

While production is measured on the Old Lands, some of the water included in these calculations may be going to the New Lands. It is presumed that such amounts are quite small especially at the beginning of the period in question.

Results and Analysis

The results of the calculations are shown in table 8-1. Neither measure of water changes much over the period in question. This is because Egypt's supply of water in the Nile is fixed by agreement with other countries in the Nile basin and can only increase slightly when rainfall in the Nile watershed is very high. Similarly the physical attributes of the Nile system do not change rapidly either, so the gross amount of water yields approximately the same net amount of water. If intermediate drainage reuse becomes more common, then the relationship between gross and net amounts of water may change. In addition if there are water savings from programs like short-season rice, which combines varietal changes with irrigation efficiency, and if the water saved goes to increased production of other crops, then this would cause the productivity per unit of water to rise.

The aggregate production for the crops under study increased during the period 1990-2001 by about 23%, and by around 12% in 2001 compared to 1997. This increment in aggregate production is due to increases in the production of long berseem, wheat, maize, and sugarcane; the production of these crops increased by about 33%, 6%, 22, and 22%, respectively, in 2001 compared to 1997; the production of rice and cotton declined in 2001 relative to 1997 by 4 and 9 percent, respectively. The amount of water reaching the High Aswan Dam (HAD) in 1998-99, 1999-2000, and 2000-01 was very large. However, because Lake Nasser was already full and the HAD needs to be protected from excess strain, the extra water reaching the dam had to be released to the Toshka Depression or to flow to the Mediterranean Sea. Some of this water may have been used for cultivation, while possibly not having been recorded as a release to agriculture. If so, this would increase the apparent productivity of water, while the actual productivity might not have increased.

The increase in productivity per unit of water was less than the increase in production, namely about 15 percent from 1990 to 2001. This reflects some increase in the releases of water during this period and any efficiencies of water use that may also have occurred.

Table 8-1: Aggregate Agricultural Production per Unit of Water, 1990-2001

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Aggregate Production (LE '000)	17,682	17,697	18,456	18,803	18,086	18,930	20,104	19,964	19,649	20,157	20,479	21,689
Index Number	100	100	104	106	102	107	114	111	111	114	116	123
Water Available (bcm) ¹	38.2	37.6	38.1	37.8	39.4	39.3	38.9	39.1	38.5	38.6	38.1	39.5
Index Number	100	98	100	99	103	103	102	102	101	101	100	103
Water Available (bcm)²	47.7	47.6	48.1	47.9	49.3	49.6	49.8	50.2	49.7	49.6	49.6	51.0
Index Number	100	100	100	101	100	103	104	104	105	104	104	104
107Production per unit of Water³	462	471	485	498	459	482	517	502	498	521	537	550
Index Number	100	102	105	108	99	104	112	109	108	113	116	119
Production per unit of Water ⁴	371	372	384	393	367	382	404	391	386	405	412	425
Index Number	100	100	100	103	106	99	109	106	104	109	111	115

Sources: Production: MALR, Agricultural Statistical yearbook, different issues;
Water: MWRI unpublished data.

Notes:

¹ Water available excluding irrigation drainage re-use and groundwater

² Total water availability from all sources in Egypt

³ The productivity of water excluding irrigation drainage re-use and groundwater

⁴ The productivity of water including the re-use and groundwater (i.e., using total water availability as the denominator).

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ANNEXES

**ANNEX A: FIRST FULL FISCAL YEAR OF PRIVATE OPERATION,
PRIVATIZED TEXTILE AFFILIATED COMPANIES**

Ginning Companies		Spinning Companies	
Arab	1996/97	Unirab S&W	1997/98
Nile	1997/98	Alexandria S&W	1998/99
		DIP-Egypt (at Esco)	1998/99
		Minya al Kamh	1999/2000
		Al Alameya	1999/2000

Notes on Spinning Companies:

Unirab S&W: Unirab has weaving and dyeing and finishing units, in addition to its core spinning operations. Unirab was 63% private as of May 1997, with most of the shares sold on the stock market in December 1996. On 5 May 1997, Unirab changed from a Law 203 to a Law 159 company. The Holding Company share was still 33% as of March 2001, meaning that the Central Auditing Agency (CAA) of the GOE could still perform annual public sector audits. Other ownership shares as of March 2001 were numerous private shareholders (47%), Misr Insurance Company (10%), and the employees' union (10%). MVE considers that Unirab operated as a private company in GOE FY 1997/98.³⁴

Alexandria S&W: This company does only spinning. As of in mid-April 1997, it was 45.6% private. It became over 50% privately owned in the GOE FY 1997/98. The conversion from a Law 202 to a Law 159 company took place in March, 1998. As of March 2001, Alexandria S&W's shares were distributed as follows: 57% to KABO/Samir Riad group; 17% to Misr Insurance; 6% to the employees' union; and 20% numerous private investors. MVE considers that Alexandria S&W operated as a private company as of GOE FY 1998/99.

DIP-Egypt at Esco: Dong-Il leased one of six units for use as a spinning facility. Dong-Il's operations began in August, 1998. Hence, it is considered as having operated as a private company during 1998/99.

Minya Al Kamh: Three spinning units of the public Sharkeya Spinning and Weaving Company were leased to an Egyptian private textile industry investor, who produces ready-made garments, on 1 July 1999. Hence, it is considered as having operated as a private company during 1999/2000.

Al Alameya: This is a small open-end spinning operation that is leased from Cairo Dyeing and Finishing Company, which began the process of liquidation in 1998.

³⁴ The GOE Fiscal Year runs from 1 July of one year to 30 June of the following calendar year.

Notes on Ginning Companies:

Arab and Nile Ginning Companies: Both former public ginning companies were privatized in 1996/97. Arab Ginning was privatized early in the marketing season (October 1996), so MVE considers that it operated as a privately owned and managed gin during the entire 1996/97 ginning season. Nile Ginning was privatized in February 1997, after most of the ginning had been completed. Hence, MVE considers that Nile Ginning operated as private company as of 1997/98.

Ahly, Nefertiti, and Modern Nile Leases of Public Gins. These three cotton trading companies negotiated leases to manage and operate some gins at several of the public ginning companies. Ahly and Nefertiti negotiated five year leases, though Ahly canceled its leases by the end of 1997/98. Nefertiti leased one gin from Nile Ginning in Minya from 1994/95 through 1998/99; Nile was publicly owned during the first three years and privately owned during the final two years. Modern Nile only leased gins for two years; once the Modern Nile Group bought Arab Ginning, it terminated its ginning leases.

Egypt (Baraka) Company built a gin (using second-hand U.S. equipment and rotary knife technology) on the Cairo-Alexandria desert road that became operational in 1995/96. This gin was sold to Arab Ginning by 1998/99 and operated as a pressing and export staging facility by the Modern Nile Group.

Nefertiti bought one of Arab Ginning's gins on the west bank of El Minya and operated this as a private gin as of 1998/99.

ANNEX B: ADDITIONAL DATA TABLES

Table B1a-1 : Lint Cotton Production, Export Volume & Value, and Domestic Utilization, 1986/87 to 2001/02

Year	Carryover Prev. Yrs. ('00 lk)	Prod- uction ('000 lk)	Total Supply (mt)	Lint Exports (mt)	Exports as % Tot. Supply	Value of Exports (mill. \$)	ELS Value (mill. \$)	ELS as % Tot. Value	Aver. Value per mt	Aver. Value per lb.	Domestic Utilizat. (mt)	Utilizat. as % Tot. Supply
1986/87	2,102	8,055	507,850	121,350	23.9%	\$328.8	\$185.8	56.5%	\$2,710	\$1.23	281,550	55.4%
1987/88	1,470	7,021	424,550	87,781	20.7%	\$329.2	\$205.1	62.3%	\$3,750	\$1.70	270,550	63.7%
1988/89	1,275	6,211	374,300	59,973	16.0%	\$288.9	\$202.3	70.0%	\$4,817	\$2.18	253,700	67.8%
1989/90	809	5,766	328,750	42,962	13.1%	\$221.2	\$177.9	80.4%	\$5,149	\$2.34	247,650	75.3%
1990/91	527	5,919	322,300	18,005	5.6%	\$87.6	\$69.3	79.1%	\$4,863	\$2.21	277,800	86.2%
1991/92	763	5,826	329,450	16,644	5.1%	\$52.8	\$32.3	61.2%	\$3,173	\$1.44	266,150	80.8%
1992/93	820	7,147	398,350	18,072	4.5%	\$45.8	\$27.6	60.2%	\$2,535	\$1.15	284,050	71.3%
1993/94	2,644	8,314	547,900	117,006	21.4%	\$221.0	\$87.1	39.4%	\$1,889	\$0.86	271,200	49.5%
1994/95	3,193	5,095	414,400	66,714	16.1%	\$146.4	\$66.7	45.5%	\$2,195	\$1.00	203,050	49.0%
1995/96	1,071	4,830	295,050	18,799	6.4%	\$78.1	\$78.1	100.0%	\$4,152	\$1.88	205,400	69.6%
1996/97	1,598	6,914	425,600	46,438	10.9%	\$122.6	\$55.5	45.2%	\$2,640	\$1.20	201,250	47.3%
1997/98	3,604	6,841	522,250	69,524	13.3%	\$160.8	\$55.9	34.7%	\$2,313	\$1.05	231,100	44.3%
1998/99	4,167	4,594	438,050	108,482	24.8%	\$242.5	\$57.9	23.9%	\$2,235	\$1.01	186,700	42.6%
1999/00	2,919	4,652	378,550	107,146	28.3%	\$244.4	\$118.3	48.4%	\$2,281	\$1.03	144,100	38.1%
2000/01	1,999	4,201	310,000	68,311	22.0%	\$164.7	\$82.4	50.0%	\$2,411	\$1.09	135,381	43.7%
2001/02	1,075	6,310	369,250	89,041	24.9%	\$191.1	\$86.1	45.1%	\$2,083	\$0.94	104,765	29.5%

Source: ALCOTEXA, *The Egyptian Cotton Gazette*, October 2000, ALCOTEXA archives, and weekly ALCOTEXA export statistical updates (for 2000/01 and recent years).

Notes: 1) The 2001/02 figures are provisional. The estimate of cotton production in lint kentars is based on deliveries to gins of seed cotton * average out-turn of 119%. Export data are commitments (not shipments) through 1 June 2002 but are probably close to final. Utilization data are through 6 June 2002. 2) Export value data are available from ALCOTEXA for the past four seasons. Before 1998/99, export values are calculated by multiplying the opening price * export volume for each variety, and then aggregating the estimated values by variety across varieties.

3) Export values are in nominal dollar terms. The dollar, against which the Egyptian pound was pegged in the narrow range of 3.3-3.4 LE = \$1.00 from 1991/92 through 1998/99, was subject to low rates of inflation during that same period.

4) Carryover estimates should be treated with caution. They are an approximation, and not all carryover is of exportable quality.

Table B1a-2: Exports of Egyptian Cotton Classified by Varieties

(mt)

Varieties	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Extra Long Staple																
Giza 45	2,894	2,718	2,111	1,342	1,156	1,098	833	632	728	1,156	927	903	170	400	887	404
Giza 76	8,465	6,782	4,876	3,356	1,411	998	1,472	2,221	2,441	1,425	1,953	2,053	1,084	987	1,526	74
Giza 70	6,219	12,091	8,344	8,875	3,499	4,727	4,365	15,393	16,305	11,650	10,340	10,067	15,065	37,081	21,976	26,648
Giza 77	42,586	28,437	22,826	18,765	7,028	2,084	2,657	22,566	7,840	4,568	4,839	6,247	7,384	6,615	5,451	478
Giza 88												215	51	527	3,342	8,746
Giza 84									953			-				
Sub Total ELS	60,163	50,028	38,157	32,338	13,095	8,907	9,327	40,811	28,268	18,799	18,058	19,486	23,754	45,610	33,181	36,359
Long Staple																
Giza 86											9,980	31,350	54,224	40,931	21,215	28,384
Giza 75	48,623	29,626	18,251	9,730	4,749	7,711	7,942	43,726	33,868		18,040	11,115	17,927	330		
Giza 69	12,473	6,773	3,396	893												
Giza 89												2,572	7,330	9,455	6,886	16,294
Giza 85								1	124		181	3,027	2,427	3,156	2,799	2,791
Giza 81	91	217	128			27		3,617	318							
Giza 80								18,759	3,902		179	1,679	1,339	3,251	801	2,863
Giza 83								6,177	235			174	454	2,574	1,875	2,351
Dandara					126			3,773								
Type Exportateur		1,136	41		36		803	142				120	1,026	1,840	1,661	2,721
Sub Total LS	61,187	37,753	21,816	10,624	4,911	7,737	8,745	76,194	38,447	0	28,379	50,037	84,728	61,536	35,237	55,403
GRAND TOTAL	121,350	87,781	59,973	42,962	18,005	16,644	18,072	117,006	66,714	18,799	46,438	69,524	108,482	107,146	68,419	89,041

Source : Cotton & International Trade Co. through 1994/95. Alexandria Cotton Exporters' Association as of 1995/96.

Notes : 1) ALCOTEXA began reporting exports in mt, instead of bales, in 1997/98. The bale to mt conversion factor for earlier years is 0.3265.

2) 2001/02 export data are commitments through 1 June 2002.

Table B1a-3 : Minimum Prices for Lint Cotton Exports, by Variety

(cents/lb.)

Varieties	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Extra Long Staple																
Giza 45	149	200	275	285	285	200	195	165	150	207	194	239	214	148	116-118	101
Giza 76	143	192	257	267	257	168	138	10	112	193	144	132	117	102	110-112	98
Giza 70	139	184	237	247	234	160	129	101	107	188	137	127	114	100	112-114	105
Giza 77	139	184	235	245	232	155	121	91	102	183	132	119	109	98	109-111	95
Giza 88												117	109	98	110-112	101
Giza 84									102							
<i>Average of ELS</i>	142	190	251	261	252	170	145	116	114	192	151	146	132	109	111-113	100
Long Staple																
Giza 86											108	102	97	92	105-108	93
Giza 75	106	149	180	185	170	120	95	81	95		107	97	91	89		
Giza 69	106	149	180	185												
Giza 89												95	91	89	101-104	88
Giza 85								78	91		104	93	89	86	98-101	86
Giza 81	106	149	180			115		78	93							
Giza 80								78	87		100	89	85	80	92-94	76
Giza 83								78	87			89	83	80	92-94	76
Dandara					138			78								
Type Exportateur		149	174		138		91	78				89				
<i>Average of LS</i>	106	149	178	185	148	117	93	78	90		104	93	89	86	98-100	84

Source : Cotton & International Trade Co. through 1994/95. Alexandria Cotton Exporters' Association as of 1995/96.

- Note :
- 1) The minimum export prices are also for the minimum exportable grade. They should be viewed as a lower limit for unit export values.
 - 2) Type exportateur (E.T.) Values are calculated from actual export commitment data for 1999/00 and 2000/01. In earlier years, the E.T. values are assumed to be equal to the Giza 80/83 values.
 - 3) Prices for 2000/01 are opening ranges.
 - 4) Prices for 2001/02 for some varieties are for the grade Good+3/8, and they are Good+1/4 for other varieties (Gizas 45, 76, 77, 80, 83).

Table B1a-4: Total Estimated Value for Lint Cotton Exports, by Variety

('000 dollars)

Varieties	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/2000	2000/01	2001/02
Extra Long Staple																
Giza 45	9,507	11,988	12,802	8,431	7,268	4,840	3,582	2,301	2,408	5,276	3,963	4,760	732	1,358	2,268	818
Giza 76	26,691	28,709	27,630	19,760	7,994	3,698	4,479	5,287	6,027	6,064	6,202	5,975	2,836	2,258	3,666	162
Giza 70	19,063	49,054	43,597	48,331	18,054	16,676	12,413	34,274	38,464	48,285	31,229	28,187	36,187	98,035	54,941	60,625
Giza 77	130,548	115,390	118,268	101,364	35,952	7,121	7,088	45,271	17,630	18,430	14,081	16,390	18,039	16,694	13,194	947
Giza 88												555	122	1,147	8,241	19,584
Giza 84									2,144							
<i>Sub Total ELS</i>	<i>185,808</i>	<i>205,141</i>	<i>202,297</i>	<i>177,886</i>	<i>69,267</i>	<i>32,336</i>	<i>27,562</i>	<i>87,133</i>	<i>66,672</i>	<i>78,055</i>	<i>55,475</i>	<i>55,866</i>	<i>57,916</i>	<i>119,440</i>	<i>82,310</i>	<i>82,136</i>
Long Staple																
Giza 86											23,763	70,496	121,306	85,829	51,716	59,194
Giza 75	113,648	97,338	72,427	39,694	17,805	20,402	16,635	78,083	70,932		42,556	23,770	36,754	663		
Giza 69	29,154	22,252	13,476	3,644												
Giza 89												2,819	15,364	18,781	16,889	31,520
Giza 85								1	250		414	3,954	4,866	6,061	7,024	5,366
Giza 81	214	714	509			68		6,220	651							
Giza 80								32,258	7,483		394	3,294	3,588	5,948	3,736	4,891
Giza 83								10,623	451			342	983	4,598	1,263	4,045
Dandara					383			6,489								
Type Exportateur		3,733	157		109		1,611	244				236	1,722	4,472		
<i>Sub Total LS</i>	<i>143,016</i>	<i>124,038</i>	<i>86,569</i>	<i>43,338</i>	<i>18,297</i>	<i>20,470</i>	<i>18,245</i>	<i>133,916</i>	<i>79,768</i>	<i>0</i>	<i>67,126</i>	<i>104,911</i>	<i>184,583</i>	<i>122,387</i>	<i>80,628</i>	<i>105,016</i>
Grand Total	328,824	329,179	288,866	221,225	87,564	52,806	45,807	221,049	146,440	78,055	122,601	160,777	242,499	225,142	162,938	187,152

Source : Cotton & International Trade Co. through 1994/95. Alexandria Cotton Exporters' Association as of 1995/96.

Note: From 1986/87 through 1997/98, the value of lint exports (export earnings in US dollars) is calculated by multiplying export volume for each variety by the minimum export price for that variety (for the lowest exportable grade). Appropriate lb. to kg conversion factors are used. The

estimates should be viewed as a lower bound for the true value of exports. Export values by variety are summed across variety to arrive at a grand total. As of 1998/99, actual reported export receipts are used, not estimated values.

Table B3a-1: Private Companies Participating in Seed Cotton Trading, 1994/95 to 2001/02

Category	Company	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
ALCOTEXA Members	Ahly (National)	X	X						
	Nefertity	X	X			X	X		
	Modern Nile		X	X	X	X	X	X	X
	El-Mabrouk		X			X	X	X	X
	Talaat Harb		X				X	X	X
	Arab Ginning		X		X	X	X	X	X
	Arab Trade and Investment				X	X	X	X	X
	Nile Ginning					X	X	X	X
	Nassco			X		X	X	X	X
	El Watany		X	X		X	X	X	X
	El-Attar (Benha)					X	X	X	X
	Tanta Cotton Trading					X	X	X	X
	Abu Madawy					X	X	X	X
	Dawlia for Crops						X	X	X
	EMEPAC						X	X	X
	EDCO							X	
	Sayadco							X	
	Subtotal	2	6	3	3	11	14	15	13
Cooperatives	Field Crop Marketing Coops	X	X				X	X	X
Spinners	Giza, Alex S&W, Unirab							3	
Some Other Registered Traders	Egypt Company	X	X					X	
	Mahmoud Abdel Rahman		X				X	X	X
	Motahida for Cotton		X					X	X
	Mahmoud Kantoush		X					X	X
	Al Ahram		X					X	X
	North Upper Egypt						X	X	X
MVE Survey Participants		45	58	16	20	67	64	43	22

Source: CATGO, PBDAC, MVE surveys of cotton traders, previous MVE and CSPP reports.

Notes: 1) Some ALCOTEXA members participated as registered traders during marketing seasons before they joined ALCOTEXA.

2) There are 13 Field Crop Marketing Coops, one for each governorate, working under the umbrella of the General Cooperative for Cotton Marketing. They are all registered (private) traders.

3) "Other Registered Traders" include all private traders other than those in the previous categories (ALCOTEXA, spinners, coops).

4) The category "MVE Survey Participants" includes both registered and non-registered traders. The first MVE survey began in 1998/99, so the numbers of survey participants reported for earlier years came from the 1998/99 sample of 74 traders.

Table B5b-1: Employment Generated in Private Spinning, 1998 to 2000

Governorate	May 1998			May 1999			May/June 2000		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<i>Qalubia</i>									
Basioutex Trade & Industry	30	10	40	30	10	40	42	18	60
DIP Egypt	165	15	180	570	30	600	590	30	620
Al Alameya (Intl. Co. for Imp., Exp. & Spin.)	0	0	0	60	19	79	63	19	82
Egyptian Co. for Cotton Spinning	0	0	0	30	10	40	60	20	80
Total	195	25	220	690	69	759	755	87	842
<i>Giza</i>									
Fager Al Eslam for Spinning & Weaving	0	0	0	100	0	100	100	0	100
Giza Spinning	382	2	384	400	2	402	400	2	402
Total	382	2	384	500	2	502	500	2	502
<i>Beheira</i>									
Hassan Gaber Darwish	0	0	0	14	3	17	14	4	18
Total	0	0	0	14	3	17	14	4	18
<i>Menoufia</i>									
Alcan Mana'ai	0	0	0	96	4	100	96	4	100
Total	0	0	0	96	4	100	96	4	100
<i>Alexandria</i>									
Spinco	105	45	150	105	45	150	112	23	135
Unirab Co.	7,420	130	7,550	7,400	150	7,550	7,360	143	7,503
Alexandria for Spinning & Weaving	3,352	217	3,569	3,285	188	3,473	3,265	183	3,448
Egyptian International for Investment	64	6	70	64	6	70	64	6	70
Attalla Trading	85	85	170	85	85	170	85	85	170
Total	11,026	483	11,509	10,939	474	11,413	10,886	440	11,326
<i>Dakahlia</i>									
Dowitex (Abdel Mona-em Moh. Dowidar)	18	2	20	18	2	20	18	2	20
Total	18	2	20	18	2	20	18	2	20
<i>Sharkia</i>									
10th of Ramadan Co.	75	0	75	90	0	90	0	0	0
Al Midani	80	0	80	90	0	90	0	0	0
Menia El Khamh	1,800	150	1,950	1,800	150	1,950			1,815
Rosetex Textile	0	0	0	105	0	105	0	0	0
10th of Ramadan S & W (Daymtex)	0	0	0	76	0	76	0	0	0
Shatex Spinning & Weaving	0	0	0	135	0	135	0	0	0
Total	1,955	150	2,105	2,296	150	2,446			1,815
<i>Kafr El Sheikh</i>									
Wezza for Spinning Cotton	0	0	0	34	2	36	38	4	42
Total	0	0	0	34	2	36	38	4	42
<i>Gharbia</i>									
Mosa'adtex (Mohamed Metwalli & Sons)	0	0	0	30	30	60	45	30	75
Al Dawlia for Spinning	0	0	0	50	0	50	55	0	55
Total	0	0	0	80	30	110	100	30	130
Grand Total	13,576	662	14,238	14,667	736	15,403	12,407	573	14,795
<i>Subtotal for Privatized Companies</i>	12,737	512	13,249	13,115	537	13,652	11,278	375	13,468
<i>Subtotal for Ring Spinners</i>	382	2	384	496	6	502	496	6	502
<i>Subtotal for Twisters</i>	173	2	175	198	2	200	18	2	20
<i>Subtotal for Open-End Spinners</i>	284	146	430	858	191	1,049	615	190	805
Final Numbers for Priv. Spinners, Adj. For Dates of Effective Privatization	8,424	295	8,719	12,807	567	13,374	12,407	573	14,795

Source: MVE surveys of private spinners in Egypt, 1999 and 2000.

Note: Minya al Khamh did not provide a breakdown of the labor force into men and women workers.

Hence, the total men + total women do not equal the grand total employment figure.

Table B7-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 2001

	Summer Rice	Total			Giza 171			Giza 172			Giza 175		
		Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons
1990	Total Valley	1,034,830	3.06	3,162,642	486,192	3.03	1,472,826	294,029	2.63	771,906	57,856	3.48	201,294
	Desert & New Land	1,515	2.30	3,485	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	1,036,345	3.06	3,166,126	486,192	3.03	1,472,826	294,029	2.63	771,906	57,856	3.48	201,294
1991	Total Valley	1,094,608	3.14	3,437,478	530,646	3.08	1,633,613	218,538	2.76	603,642	42,178	3.44	145,113
	Desert & New Land	5,051	1.80	9,092	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	1,099,659	3.13	3,446,570	530,646	3.08	1,633,613	218,538	2.76	603,642	42,178	3.44	145,113
1992	Total Valley	1,209,141	3.22	3,897,926	595,314	3.14	1,870,710	180,780	2.98	538,432	31,399	3.52	110,555
	Desert & New Land	5,386	1.93	10,408	5,386	1.93	10,408	0	0.00	0	0	0.00	0
	Total Egypt	1,214,527	3.22	3,908,334	600,700	3.13	1,881,118	180,780	2.98	538,432	31,399	3.52	110,555
1993	Total Valley	1,276,295	3.25	4,147,613	615,741	3.13	1,926,701	137,170	2.98	408,134	30,210	3.37	101,948
	Desert & New Land	5,495	2.10	11,522	5,495	2.10	11,522	0	0.00	0	0	0.00	0
	Total Egypt	1,281,790	3.24	4,159,135	621,236	3.12	1,938,223	137,170	2.98	408,134	30,210	3.37	101,948
1994	Total Valley	1,371,017	3.33	4,566,681	691,263	3.23	2,231,059	165,598	3.14	519,849	38,903	3.44	133,643
	Desert & New Land	6,693	2.27	15,220	6,693	2.27	15,220	0	0.00	0	0	0.00	0
	Total Egypt	1,377,710	3.33	4,581,901	697,956	3.22	2,246,279	165,598	3.14	519,849	38,903	3.44	133,643
1995	Total Valley	1,386,449	3.43	4,755,220	750,438	3.42	2,565,773	150,587	3.27	492,216	24,015	3.64	87,466
	Desert & New Land	13,571	2.42	32,878	1,271	2.22	2,826	2,375	1.58	3,743	140	2.60	364
	Total Egypt	1,400,020	3.42	4,788,098	751,709	3.42	2,568,599	152,962	3.24	495,959	24,155	3.64	87,830
1996	Total Valley	1,386,198	3.49	4,843,685	709,875	3.45	2,448,591	85,726	3.26	279,477	9,403	3.59	33,762
	Desert & New Land	19,070	2.71	51,703	6,566	2.65	17,388	900	2.75	2,475	774	2.00	1,546
	Total Egypt	1,405,268	3.48	4,895,388	716,441	3.44	2,465,979	86,626	3.25	281,952	10,177	3.47	35,308
1997	Total Valley	1,525,756	3.55	5,412,448	742,001	3.51	2,607,743	98,529	3.30	325,063	919	3.35	3,081
	Desert & New Land	24,116	2.80	67,562	8,951	2.43	21,795	296	2.66	788	45	3.00	135
	Total Egypt	1,549,872	3.54	5,480,010	750,952	3.50	2,629,538	98,825	3.30	325,851	964	3.34	3,216
1998	Total Valley	1,201,730	3.64	4,375,813	447,756	3.58	1,604,512	12,843	3.25	41,783	2,296	3.06	7,032
	Desert & New Land	23,225	3.20	74,424	17,835	3.40	60,683	830	2.09	1,737	0	0.00	0
	Total Egypt	1,224,955	3.63	4,450,237	465,591	3.58	1,665,195	13,673	3.18	43,520	2,296	3.06	7,032
1999	Total Valley	1,511,877	3.74	5,661,879	310,441	3.52	1,092,278	9,908	3.22	31,870	0	0.00	0
	Desert & New Land	25,000	3.39	84,691	1,399	3.00	4,198	0	0.00	0	0	0.00	0
	Total Egypt	1,536,877	3.74	5,746,570	311,840	3.52	1,096,476	9,908	3.22	31,870	0	0.00	0
2000	Total Valley	1,539,531	3.83	5,903,718	157,821	3.51	553,489	4,238	3.24	13,723	0	0.00	0
	Desert & New Land	29,405	3.29	96,778	13,826	3.05	42,238	15	3.00	45	0	0.00	0
	Total Egypt	1,568,936	3.82	6,000,496	171,647	3.47	595,727	4,253	3.24	13,768	0	0.00	0
2001	Total Valley	1,330,417	3.91	5,197,505	107,230	3.29	353,195	401	3.04	1,221	0	0.00	0
	Desert & New Land	9,853	2.96	29,198	9,853	2.96	29,198	0	0.00	0	0	0.00	0
	Total Egypt	1,340,270	3.90	5,226,703	117,083	3.27	382,393	401	3.04	1,221	0	0.00	0

Source : Department for Agricultural Economics Affairs , MALR

Table B7-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 2001

	Summer Rice	Giza 176			Giza 181			IR 28			Reho (Giza 173)		
		Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons
1990	Total Valley	59,197	3.61	213,638	45,949	3.85	176,699	73,407	3.72	273,091	11,876	2.89	34,283
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	59,197	3.61	213,638	45,949	3.85	176,699	73,407	3.72	273,091	11,876	2.89	34,283
1991	Total Valley	211,348	3.46	732,029	42,422	3.42	145,282	18,586	4.21	78,317	23,603	3.23	76,312
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	211,348	3.46	732,029	42,422	3.42	145,282	18,586	4.21	78,317	23,603	3.23	76,312
1992	Total Valley	310,082	3.39	1,052,653	43,082	3.60	154,894	18,755	4.11	77,159	15,369	3.13	48,031
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	310,082	3.39	1,052,653	43,082	3.60	154,894	18,755	4.11	77,159	15,369	3.13	48,031
1993	Total Valley	398,969	3.45	1,376,227	37,857	3.55	134,218	26,909	4.21	113,402	27,820	2.93	81,545
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	398,969	3.45	1,376,227	37,857	3.55	134,218	26,909	4.21	113,402	27,820	2.93	81,545
1994	Total Valley	429,062	3.53	1,515,078	8,499	4.01	34,076	681	3.44	2,341	35,572	3.53	125,537
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	429,062	3.53	1,515,078	8,499	4.01	34,076	681	3.44	2,341	35,572	3.53	125,537
1995	Total Valley	377,535	3.54	1,334,955	6,600	3.98	26,256	16	3.88	62	39,652	3.17	125,879
	Desert & New Land	8,526	2.66	22,689	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	386,061	3.52	1,357,644	6,600	3.98	26,256	16	3.88	62	39,652	3.17	125,879
1996	Total Valley	264,432	3.42	903,830	4,696	4.03	18,929	0	0.00	0	51,180	3.35	171,680
	Desert & New Land	8,164	2.88	23,500	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	272,596	3.40	927,330	4,696	4.03	18,929	0	0.00	0	51,180	3.35	171,680
1997	Total Valley	159,424	3.38	538,901	1,866	4.09	7,634	652	4.42	2,884	55,562	3.43	190,708
	Desert & New Land	11,852	3.11	36,807	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	171,276	3.36	575,708	1,866	4.09	7,634	652	4.42	2,884	55,562	3.43	190,708
1998	Total Valley	58,488	3.38	197,438	0	0.00	0	270	3.72	1,004	39,804	3.46	137,529
	Desert & New Land	3,312	2.60	8,601	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	61,800	3.33	206,039	0	0.00	0	270	3.72	1,004	39,804	3.46	137,529
1999	Total Valley	65,437	3.24	212,267	201	3.99	802	0	0.00	0	48,424	3.47	167,990
	Desert & New Land	136	3.50	476	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	65,573	3.24	212,743	201	3.99	802	0	0.00	0	48,424	3.47	167,990
2000	Total Valley	65,398	3.25	212,430	0	0.00	0	0	0.00	0	29,937	3.31	98,967
	Desert & New Land	430	3.30	1,419	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	65,828	3.25	213,849	0	0.00	0	0	0.00	0	29,937	3.31	98,967
2001	Total Valley	6,1555	3.37	20,735	4	0.00	18	0	0.00	0	18,343	3.55	65,182
	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	6,155	3.37	20,735	4	0.00	18	0	0.00	0	18,343	3.55	65,182

Source : Department for Agricultural Economics Affairs , MALR

Table B7-1: Area, Yield and Production of Summer Rice by Variety, 1990 to 2001

	Summer Rice	Giza 178			Giza 177			Sakha 101			Sakha 102			Other		
		Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area Feddan	Yield Tons / Fed.	Production Tons	Area	Yield	Production
1990	Total Valley	0	0.00	0	0	0.00	0							6,324	2.99	18,905
	Desert & New Land	0	0.00	0	0	0.00	0							1,515	2.30	3,485
	Total Egypt	0	0.00	0	0	0.00	0							7,839	2.86	22,390
1991	Total Valley	0	0.00	0	0	0.00	0							7,287	3.18	23,170
	Desert & New Land	0	0.00	0	0	0.00	0							5,051	1.80	9,092
	Total Egypt	0	0.00	0	0	0.00	0							12,338	2.61	32,262
1992	Total Valley	0	0.00	0	0	0.00	0							14,360	3.17	45,492
	Desert & New Land	0	0.00	0	0	0.00	0							0	0.00	0
	Total Egypt	0	0.00	0	0	0.00	0							14,360	3.17	45,492
1993	Total Valley	0	0.00	0	0	0.00	0							1,619	3.36	5,438
	Desert & New Land	0	0.00	0	0	0.00	0							0	0.00	0
	Total Egypt	0	0.00	0	0	0.00	0							1,619	3.36	5,438
1994	Total Valley	0	0.00	0	0	0.00	0							1,439	3.54	5,098
	Desert & New Land	0	0.00	0	0	0.00	0							0	0.00	0
	Total Egypt	0	0.00	0	0	0.00	0							1,439	3.54	5,098
1995	Total Valley	3,670	3.68	13,519	23,742	3.41	80,889							10,194	2.77	28,205
	Desert & New Land	0	0.00	0	0	0.00	0							1,259	2.59	3,256
	Total Egypt	3,670	3.68	13,519	23,742	3.41	80,889							11,453	2.75	31,461
1996	Total Valley	126,570	4.12	521,580	134,069	3.47	465,044							247	3.21	792
	Desert & New Land	0	0.00	0	0	0.00	0							2,666	2.55	6,794
	Total Egypt	126,570	4.12	521,580	134,069	3.47	465,044							2,913	2.60	7,586
1997	Total Valley	294,149	3.82	1,123,050	167,939	3.55	596,649							4,715	3.55	16,735
	Desert & New Land	1,430	3.13	4,477	317	2.43	769							1,225	2.28	2,791
	Total Egypt	295,579	3.81	1,127,527	168,256	3.55	597,418							5,940	3.29	19,526
1998	Total Valley	282,214	3.82	1,078,856	279,962	3.57	1,000,761	42,680	4.09	174,479	35,286	3.74	132,011	131	3.11	408
	Desert & New Land	756	2.88	2,179	492	2.49	1,224	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	282,970	3.82	1,081,035	280,454	3.57	1,001,985	42,680	4.09	174,479	35,286	3.74	132,011	131	3.11	408
1999	Total Valley	346,493	3.97	1,374,723	285,048	3.59	1,023,388	214,575	4.08	875,600	222,823	3.84	855,354	8,527	3.24	27,607
	Desert & New Land	5,747	3.60	20,670	8,572	3.44	29,523	8,414	3.21	27,042	0	0.00	0	732	3.80	2,782
	Total Egypt	352,240	3.96	1,395,393	293,620	3.59	1,052,911	222,989	4.05	902,642	222,826	3.84	855,354	9,259	3.28	30,389
2000	Total Valley	373,028	3.96	1,476,577	279,835	3.66	1,023,772	386,814	4.09	1,582,889	215,734	3.94	849,588	26,726	3.45	92,283
	Desert & New Land		13,211	3.51	46,390	1,046	3.26	3,405	321	3.36	1,077	530	3.94	2,090	26	4,381.14
	Total Egypt		386,239	3.94	1,522,967	280,881	3.66	1,027,177	387,135	4.09	1,583,966	216,264	3.94	851,678	26,752	3,459.2,397
2001	Total Valley	245,433	3.89	954,105	280,215	3.59	1,005,639	484,585	4.17	2,021,077	163,042	4.22	688,068	25,009	3.53	88,265

	Desert & New Land	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0
	Total Egypt	245,433	3.89	954,105	280,215	3.59	1,005,639	484,585	4.17	2,021,077	163,042	4.22	688,068	25,009	3.53	88,265

Source : Department for Agricultural Economics Affairs , MALR

Table B7-2a: Consumptive Use of Water, Giza 171 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m³/fed,) 5	Amount of water per fed. per day 6	Total Amount of Water m³ 7
1990	486,192	155	10	145	4714	32.51	2,291,909,088
1991	530,646	155	10	145	4714	32.51	2,501,465,244
1992	600,700	155	10	145	4714	32.51	2,831,699,800
1993	621,236	155	10	145	4714	32.51	2,928,506,504
1994	697,956	155	10	145	4714	32.51	3,290,164,584
1995	751,709	155	10	145	4714	32.51	3,543,556,226
1996	716,441	155	10	145	4714	32.51	3,377,302,874
1997	750,952	155	10	145	4714	32.51	3,539,987,728
1998	465,591	155	10	145	4715	32.52	2,195,261,565
1999	311,840	155	10	145	4715	32.52	1,470,637,440
2000	171,647	155	10	145	4716	32.52	809,487,252
2001	117,083	155	10	145	4717	32.53	552,280,511

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2b: Consumptive Use of Water, Giza 172 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	294,029	155	10	145	4714	32.51	1,386,052,706
1991	218,538	155	10	145	4714	32.51	1,030,188,132
1992	180,780	155	10	145	4714	32.51	852,196,920
1993	137,170	155	10	145	4714	32.51	646,619,380
1994	165,598	155	10	145	4714	32.51	780,628,972
1995	152,962	155	10	145	4714	32.51	721,062,868
1996	86,626	155	10	145	4714	32.51	408,354,964
1997	98,825	155	10	145	4714	32.51	465,861,050
1998	13,673	155	10	145	4714	32.51	64,468,195
1999	9,908	155	10	145	4714	32.51	46,706,312
2000	4,253	155	10	145	4714	32.51	20,048,642
2001	401	155	10	145	4715	32.52	1,890,715

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2c: Consumptive Use of Water, Giza 175 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	57,856	125	10	115	4714	40.99	272,733,184
1991	42,178	125	10	115	4714	40.99	198,827,092
1992	31,399	125	10	115	4714	40.99	148,014,886
1993	30,210	125	10	115	4714	40.99	142,409,940
1994	38,903	125	10	115	4714	40.99	183,388,742
1995	24,155	125	10	115	4714	40.99	113,866,670
1996	10,177	125	10	115	4714	40.99	47,974,378
1997	964	125	10	115	4714	40.99	4,544,296
1998	2,296	125	10	115	4714	40.99	10,823,344
1999	0	125	10	115	4714	40.99	0
2000	0	125	10	115	4714	40.99	0
2001	0	125	10	115	4715	41.00	0

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2d: Consumptive Use of Water, Giza 176 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	59,197	145	10	135	4714	34.92	279,054,658
1991	211,348	145	10	135	4714	34.92	996,294,472
1992	310,082	145	10	135	4714	34.92	1,461,726,548
1993	398,969	145	10	135	4714	34.92	1,880,739,866
1994	429,062	145	10	135	4714	34.92	2,022,598,268
1995	386,061	145	10	135	4714	34.92	1,819,891,554
1996	272,596	145	10	135	4714	34.92	1,285,017,544
1997	171,276	145	10	135	4714	34.92	807,395,064
1998	61,800	145	10	135	4714	34.92	291,325,200
1999	65,573	145	10	135	4714	34.92	309,111,122
2000	65,828	145	10	135	4714	34.92	310,313,192
2001	6,155	145	10	135	4715	34.93	29,020,825

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2e: Consumptive Use of Water, Giza 181 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	45,949	145	10	135	4714	34.92	216,603,586
1991	42,422	145	10	135	4714	34.92	199,977,308
1992	43,082	145	10	135	4714	34.92	203,088,548
1993	37,857	145	10	135	4714	34.92	178,457,898
1994	8,499	145	10	135	4714	34.92	40,064,286
1995	6,600	145	10	135	4714	34.92	31,112,400
1996	4,696	145	10	135	4714	34.92	22,136,944
1997	1,866	145	10	135	4714	34.92	8,796,324
1998	0	145	10	135	4714	34.92	0
1999	201	145	10	135	4714	34.92	947,514
2000	0	145	10	135	4714	34.92	0
2001	4	146	10	136	4715	34.67	18,860

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2f: Consumptive Use of Water, Philipino Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	73,407	125	10	115	4714	40.99	346,040,598
1991	18,586	125	10	115	4714	40.99	87,614,404
1992	18,755	125	10	115	4714	40.99	88,411,070
1993	26,909	125	10	115	4714	40.99	126,849,026
1994	681	125	10	115	4714	40.99	3,210,234
1995	16	125	10	115	4714	40.99	75,424
1996	0	125	10	115	4714	40.99	0
1997	652	125	10	115	4714	40.99	3,073,528
1998	270	125	10	116	4715	40.99	1,272,780
1999	0	125	10	115	4714	40.99	0
2000	0	125	10	115	4714	40.99	0
2001	0	126	10	116	4715	40.65	0

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2g: Consumptive Use of Water, Giza 173 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	11,876	155	10	145	4714	32.51	55,983,464
1991	23,603	155	10	145	4714	32.51	111,264,542
1992	15,369	155	10	145	4714	32.51	72,449,466
1993	27,820	155	10	145	4714	32.51	131,143,480
1994	35,572	155	10	145	4714	32.51	167,686,408
1995	39,652	155	10	145	4714	32.51	186,919,528
1996	51,180	155	10	145	4714	32.51	241,262,520
1997	55,562	155	10	145	4714	32.51	261,919,268
1998	39,804	155	10	145	4715	32.52	187,675,860
1999	48,424	155	10	145	4715	32.52	228,319,160
2000	29,937	155	10	145	4715	32.52	141,152,955
2001	18,343	156	10	146	4716	32.30	86,505,588

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2h: Consumptive Use of Water, Giza 178 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	0	135	10	125	4714	37.71	0
1991	0	135	10	125	4714	37.71	0
1992	0	135	10	125	4714	37.71	0
1993	0	135	10	125	4714	37.71	0
1994	0	135	10	125	4714	37.71	0
1995	3,670	135	10	125	4714	37.71	17,300,380
1996	126,570	135	10	125	4714	37.71	596,650,980
1997	295,579	135	10	125	4714	37.71	1,393,359,406
1998	282,970	135	10	125	4714	37.71	1,334,203,550
1999	352,240	135	10	125	4714	37.71	1,660,459,360
2000	386,239	135	10	125	4714	37.71	1,820,730,646
2001	245,433	136	10	126	4715	37.42	1,157,216,595

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2i: Consumptive Use of Water, Giza 177 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	0	125	10	115	4714	40.99	0
1991	0	125	10	115	4714	40.99	0
1992	0	125	10	115	4714	40.99	0
1993	0	125	10	115	4714	40.99	0
1994	0	125	10	115	4714	40.99	0
1995	23,742	125	10	115	4714	40.99	111,919,788
1996	134,069	125	10	115	4714	40.99	632,001,266
1997	168,256	125	10	115	4714	40.99	793,158,784
1998	280,454	125	10	115	4714	40.99	1,322,060,156
1999	293,620	125	10	115	4714	40.99	1,384,124,680
2000	280,881	125	10	115	4714	40.99	1,324,073,034
2001	280,215	126	10	116	4715	40.65	1,321,213,725

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2m: Consumptive Use of Water, Sakha 101 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990			10				
1991			10				
1992			10				
1993			10				
1994			10				
1995			10				
1996			10				
1997			10				
1998	42,680	135	10	125	4714	37.71	201,193,520
1999	222,989	135	0	135	4714	34.92	1,051,170,146
2000	387,135	135	0	135	4714	34.92	1,824,954,390
2001	484,585	136	0	136	4714	34.67	2,284,818,275

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-2n: Consumptive Use of Water, Sakha 102 Rice, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990				0			0
1991				0			0
1992				0			0
1993				0			0
1994				0			0
1995				0			0
1996				0			0
1997				0			0
1998	35,286	125	10	115	4714	40.99	166,338,204
1999	222,823	125	10	115	4714	40.99	1,050,387,622
2000	216,264	125	10	115	4714	40.99	1,019,468,496
2001	163,042	126	10	116	4714	40.65	768,743,030

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-3: Consumptive Use of Water if All Rice Varieties are Long Season, 1990 to 2001

Years	Area (fed) 1	Days to Maturity 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	1,036,345	125	10	115	3739	32.51	3,874,572,331
1991	1,099,659	125	10	115	3739	32.51	4,111,283,728
1992	1,214,527	125	10	115	3739	32.51	4,540,739,531
1993	1,281,790	125	10	115	3739	32.51	4,792,15,013
1994	1,377,710	125	10	115	3739	32.51	5,150,830,125
1995	1,400,020	125	10	115	3739	32.51	5,234,240,291
1996	1,405,268	125	10	115	3739	32.51	5,253,860,934
1997	1,549,872	125	10	115	3739	32.51	5,794,490,413
1998	1,224,955	125	10	115	3739	32.52	4,580,698,103
1999	1,536,877	125	10	115	3739	32.52	5,747,125,044
2000	1,568,936	125	10	115	3739	32.52	5,867,009,121
2001	1,340,270	125	10	115	3739	32.52	5,012,979,530

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

Table B7-4: Consumptive Use of Water if All Rice Varieties are Short Season, 1990 - 1999

Years	Area (fed) 1	Days to Maturity* 2	Days Not Irrigated 3	Number of Irrigated Days 4	Consumptive of Water (m ³ /fed.) 5	Amount of water per fed. per day 6	Total Amount of Water m ³ 7
1990	1,036,345	125	10	115	3739	32.51	3,874,572,331
1991	1,099,659	125	10	115	3739	32.51	4,111,283,728
1992	1,214,527	125	10	115	3739	32.51	4,540,739,531
1993	1,281,790	125	10	115	3739	32.51	4,792,215,013
1994	1,377,710	125	10	115	3739	32.51	5,150,830,125
1995	1,400,020	125	10	115	3739	32.51	5,234,240,291
1996	1,405,268	125	10	115	3739	32.51	5,253,860,934
1997	1,549,872	125	10	115	3739	32.51	5,794,490,413
1998	1,224,955	125	10	115	3739	32.52	4,580,698,103
1999	1,536,877	125	10	115	3739	32.52	5,747,125,044

Source: MALR/EAS and MWRI.

Notes: 4=2-3 , 6=5/4, 7=6*1*4

* Days of Maturity assumed for the Sakha 102 which is the Lowest Variety